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AN INDEX OF SOVIET INDUSTRIAL OUTPUT

By NORMAN M. KAPLAN AND RICHARD H. MOORSTEEN*

In this paper we present (a) the results of a calculation of an index of Soviet industrial output, and (b) some comments on, and applications of, these results. Underlying this paper are two studies: one on machinery prices and production [6] and another, which incorporates the relevant results of the machinery study, on the output of all industrial products [4]. This paper is a summary of the second of these studies and, as such, omits the detailed documentation and explanations which are available there or which, with respect to the machinery component, will be available when the machinery study is published. The results, shorn of important details, are presented here because the topic appears to be of some current interest. The results are, however, tentative for a variety of reasons; some of them are indicated below but others appear only in the underlying materials.

In Section I we present the index of industrial output and briefly discuss its nature and limitations. Section II is a miscellany in which we: (a) compare our index with others; (b) discuss some dynamic aspects of Soviet industrial growth; (c) explore the indications of future rates of growth; (d) present an index of the output of final products; and (e) estimate changes in productivity.

I. *The Index*

Table 1 presents the computed index for all industrial products and for major components thereof; the last column presents the weights employed in obtaining the index from the subindexes for the major components. The index is intended to measure the net product of industry, i.e., gross output less materials consumed in mining, manufacturing, and electric power production. At various stages in the aggregation, however, important compromises and approximations were neces-

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TABLE 1—AN INDEX OF SOVIET INDUSTRIAL OUTPUT
(1950 = 100)

	1927/28	1932	1937	1940	1945	1950	1951	1952	1953	1954	1955	1956	1957	1958	Weight for Commodity Group (percentage)
All Industrial Products	27.1	41.6	67.4	71.2	36.6	100.0	111.5	118.9	130.3	143.6	158.1	171.7	188.4	202.3	100.0
1. Machinery	6.8	19.5	40.9	34.3	13.6	100.0	98.5	100.2	111.4	120.7	136.2	150.6	175.1	185.0	19.4
2. Other producers' goods	21.4	41.1	66.5	71.5	43.1	100.0	112.7	121.5	131.2	145.0	160.1	173.2	189.8	206.8	54.8
a. Ferrous metals	15.7	24.5	66.1	68.0	43.3	100.0	114.2	127.5	140.5	153.2	167.9	179.9	189.7	202.7	9.5
b. Fuels	21.5	39.8	61.6	73.1	54.5	100.0	109.8	119.4	130.1	143.9	167.2	190.2	216.5	242.0	14.4
c. Electric power	5.5	14.8	39.7	53.0	47.5	100.0	114.0	130.6	147.4	165.1	186.6	210.2	229.9	255.9	1.5
d. Chemicals	6.9	17.8	52.6	56.5	25.4	100.0	110.6	119.5	130.1	146.0	165.3	182.2	198.6	214.3	3.3
e. Lumber, wood products and paper	28.7	56.8	72.9	78.7	42.5	100.0	113.1	116.5	120.5	132.7	139.1	143.8	153.2	161.8	19.9
f. Building materials	18.8	37.6	72.3	62.9	26.0	100.0	116.7	132.6	150.3	169.3	190.4	204.7	232.0	260.5	6.1
3. Consumers' goods	54.3	59.4	89.1	98.3	40.2	100.0	118.8	127.3	142.9	157.9	170.3	184.2	195.4	205.7	25.8
a. Foods	66.7	70.0	104.6	109.2	49.4	100.0	115.0	124.0	136.2	141.9	156.7	168.7	180.3	187.9	10.0
b. Nonfoods	46.4	52.7	79.4	91.4	34.4	100.0	121.2	129.5	147.1	167.9	178.9	194.0	204.9	217.0	15.8

Source: [4, Table 22].

sary: the index is computed by aggregating physical output series at various stages of fabrication, using 1950 price weights within certain groups of commodities and 1950 wage-bill weights among these commodity groups. Though limitations of space preclude a full account and appraisal,[1] we will describe, and comment briefly on, each aspect of the computation: (a) the underlying physical output series, (b) the first stages of aggregation, and (c) the higher levels of aggregation.

A. *The Physical Output Series*

Except with respect to machinery, no extensive survey of Soviet sources has been attempted and the present study relies primarily on the output data provided by the recent Soviet statistical handbooks—particularly by [15] and [16]. The most important but inevitable omission from our output sample is munitions and other military end-items. Probably the most important in the long list of other omissions are chemical equipment, nonferrous metals, refined petroleum products, sewn goods, nonalcoholic beverages, bread and bakery products, furniture.[2]

For a number of the important omissions other than munitions, we have attempted by imputation to employ surrogate commodities. That is to say, by appropriate choice of the weights, we let ferrous metals stand for nonferrous metals as well, textile fabrics for sewn goods as well, and similarly in other cases. Though each of these imputations undoubtedly gives rise to errors, the errors are believed to be less than those involved in no imputations, for the latter would imply a relative increase in output for the excluded commodities which is equal to that for all included commodities.

In addition to the omissions, there are a number of other difficulties with respect to the physical output series which we have been unable to allow for in the index computation. Probably the most important are the following: (1) The output data for the various periods refer to the

[1] For a detailed statement of sources and methods and for comments on the results, see [4, pp. 1-73 and Tables 1-22].

[2] All in all, the machinery index includes 210 physical output series; other producers' goods, 36 physical output series; and consumers' goods, 37 physical output series.

Not all the output series available from the statistical handbooks have been included in the index; some series do not extend over all years of interest and others were omitted because of the absence of appropriate weights. An alternative calculation was made incorporating the additional output series available for the 1950-1955 period and for which weights could be obtained; the result was a small but perceptible increase in the 1955 index with 1950 = 100 [4, Tables 14 and 15].

Also, many of the physical output series are themselves aggregates within which additional output data are available for some years. For example, the index includes pig iron output in tons and the statistical handbooks also provide data on six varieties of pig iron—cast iron for steel, foundry iron, spiegeleisen, etc. An alternative calculation for the 1950-1955 period, which incorporated the maximum detail available, yielded essentially no change in the index [4, Tables 10 and 11].

respective territorial boundaries of those periods. Hence, part of the 1927/28-1940 increment in output represents the 1939-1940 expansion in territory. (2) Some, though far from all, of the consumers' goods series exclude the 1927/28 output of small-scale industry. Hence, the 1927/28 value of the index is understated.

B. *The First Stages of Aggregation*

The weights by which the physical output series are combined into indexes for machinery and for the indicated commodity groups within other producers' goods are, or are intended to approximate, Jan. 1, 1950 wholesale prices. Prices of this date were chosen (a) because wholesale prices during the 1950's are believed to correspond at least roughly with production costs as reckoned in Soviet accounts, and (b) because previous studies of Soviet prices provide more abundant information for Jan. 1, 1950 than for any later date.

In the absence of wholesale price data for consumers' goods, the indexes for foods and nonfoods are obtained by weighting the relevant output relatives by the 1950 value of retail sales or approximations thereto. When these weights are multiplied by the corresponding output relatives, the results differ from the producers' goods values (price times output) in two ways: (a) the values are retail rather than wholesale;[3] and (b) they differ from a price-weighted output series to the extent that quantities *sold* differ from quantities *produced*.

Neither set of weights is available in sufficient detail or extent to correspond exactly with all the output series used. Hence, various approximations were often used: (a) estimates of average wholesale prices for output series more aggregative than the commodities for which price information exists; (b) the adjustment to Jan. 1, 1950 of prices of another date by the use of price index numbers; (c) the substitution of the product of a 1950 retail price and 1950 output for retail sales in cases where the latter are unavailable.

C. *The Higher Levels of Aggregation*

We regard an index of the net product of industry—i.e., of gross output less materials consumed—as an appropriate general-purpose measure of changes in the level of industrial activity. It is a measure which in principle (a) avoids the double-counting of gross outputs, (b) is in-

[3] However, as will be indicated below, we have used our weights to combine official Soviet indexes for branches of industry into indexes for foods and for nonfoods in the 1950-1955 period; the results are very close to the official indexes for foods and nonfoods. Since the official indexes use wholesale price weights, these results suggest that relative retail prices within foods and within nonfoods are not sufficiently different from wholesale prices to yield appreciable differences in the output indexes, at least in the 1950-1955 period. See [4, Table 26].

sensitive to changes in vertical integration, and (c) eliminates the contribution of nonindustrial sectors, in the form of materials supplied, to industrial output.

Unfortunately, we have not found it possible to construct such a measure directly for lack of adequate data. Instead, we have sought an approximate indirect measure—an index of output with value-added weights.[4] And even the latter is not properly constructed. We do not have value-added weights but must rely on wage-bill distributions as approximations. Furthermore, the wage-bill distributions cannot be applied at all levels of aggregation but are used only to obtain (a) the index for consumers' goods from the food and nonfood indexes, (b) the index for producers' goods other than machinery from the indicated subindexes, and (c) the index for all industrial products from the indexes for machinery, other producers' goods and consumers' goods.

The relevant wage-bill distributions, obtained from the 1950 distribution of wage-earners by industrial branches and estimates of 1950 average monthly earnings, are summarized in the last column of Table 1. The most important of the difficulties encountered in the derivation of the wage-bill distribution is the necessity to exclude from the data for the machine-building and metal-working industry that portion which represents payments to workers producing munitions. On the basis of somewhat ambiguous official data on the distribution of the gross value of output, we have taken the share of munitions workers in the machine-building and metal-working wage-bill to be 50 per cent. Though this is a rough calculation, substantially different alternative shares do not greatly affect the index for all industrial products: as against our index of 202 in 1958 and 27 in 1927/28, alternative shares of 25 and 75 per cent for munitions yield, respectively, indexes of 201 and 204 in 1958 and indexes of 25 and 29 in 1927/28.

Thus, the index in Table 1, conceived as a measure of the changes in the net product of civilian industry, is subject to errors which arise from various considerations: (1) ambiguities in, and exclusions from, the physical output series; (2) inaccuracies and imputations in the price, retail sales, and wage-bill weights; (3) the heterogeneity of the weighting system as a whole; and (4) the approximate nature of a value-added-weighted index.[5] In most cases, neither the magnitude nor

[4] Given complete commodity coverage, the direct and indirect measures will be identical if, for each commodity produced by industry, value added (gross value minus materials consumed, both at weight-year prices) varies over time in direct proportion to the output of that commodity. However, to the extent that real cost reductions (increases) have occurred in materials requirements, a value-added-weighted index will understate (overstate) the growth of net product.

[5] Also, for some of the years covered in Table 1, the indexes for some commodity groups are obtained by interpolations or extrapolations based on sets of commodities which are

the direction of error is known. In some cases, however, at least the direction of error is clear and these cases suggest that our index understates the 1950-1958 increase in output and overstates the 1927/28-1950 increase.

The overstatement arises from our exclusion of some small-scale industry output for 1927/28 and, in terms of growth rate comparisons, from our inclusion of the output in territories added in 1939-1940. The understatement of the 1950-1958 increase arises primarily from a deficiency in the post-1950 machinery index.[6] In the machinery index an attempt is made to allow for changes over time in the average quality of the products included within any single physical output series. Though precision in this aspect of the calculation is hardly possible, the problem of allowing for quality change in the 1927/28-1950 period is not so acute. Machinery output then was characterized by considerable standardization; and changes in quality, although large, tended to occur discretely and infrequently for most items. With the beginning of the 1950's, however, the level of technical sophistication in Soviet machine-building rose rapidly, the number of models produced proliferated, and the models changed frequently. Because of an insufficient allowance for post-1950 improvements in the quality of machinery output, the machinery index is believed to understate significantly the actual increase in output from about 1950 on.

II. *Some Implications and Applications of our Results*

A. *Comparisons of Our Indexes with Others*

Our index of industrial output, of course, is not the first computed by students of the Soviet economy: among others, D. R. Hodgman [1], N. Jasny [2], G. W. Nutter [7], F. Seton [12], and D. B. Shimkin

different from those underlying the indexes for other years. The indexes and commodity groups involved are the following: (a) the 1951, 1952, and 1954 indexes for foods and nonfoods and the 1958 index for nonfoods; and (b) the 1951-1954 and 1956-1958 indexes for chemicals and building materials and the 1951-1954 indexes for fuels. However, the errors involved in interpolation or extrapolation are relatively small. See [4, Section 3 and Tables 16, 17, 19, and 20].

[6] There is evidence that other factors also cause our index to understate the increase in output over the period as a whole and over the post-1950 period separately. Among them: (a) our omission of nonferrous metals output series; (b) our exclusion of output data available only for recent years; and (c) our use of wage-bill data rather than wage-bill plus capital consumption to represent value-added. See [4, pp. 71-73 and Table 15]. In each of these cases, the error appears to be relatively small, though taken together their effect may be appreciable.

The last of the factors listed above deserves an additional comment. In an effort to test the sensitivity of our results to inclusion of other factor payments, we have performed an alternative, illustrative calculation in which combined capital consumption and wage-bill weights replace the wage-bill weights used in Table 1. The result is an index which increases only slightly more than the index in Table 1 [4, pp. 33-36, 55-56].

and F. A. Leedy [13] have also made such computations. We add our estimates to those already in existence for the following reasons: (a) For various purposes, including the determination of changes in the annual rates of industrial growth, it is desirable to obtain annual indexes for the post-1950 period extending to the most recent years possible. The Hodgman index terminates in 1951, the Jasny index in 1950, and only the Shimkin-Leedy index goes beyond 1955 to 1956. Only the Seton and Shimkin-Leedy indexes provide annual 1950-1955 data. (b) The machinery component of our index, the most troublesome component of an index of industrial output, rests upon an independent and intensive study of machinery prices and production [6]. (c) While the indexes already available differ in results, little by way of published details, except for [1] and [12], are yet available to account for the differences.

Table 2 summarizes the results obtained in these other studies in comparison with ours. In some cases the results differ for more or less obvious reasons. The Hodgman indexes preceded the appearance of the recent Soviet statistical handbooks and hence rely on far fewer output series, particularly for the postwar years. The Seton index is not a

TABLE 2—COMPARISONS BETWEEN KAPLAN-MOORSTEEN INDEXES AND OTHERS
(All Indexes with 1950=100)

	1928	1937	1940	1955
All Industrial Products				
(i) Hodgman	15	57	67	—
(ii) Jasny	21	61	—	—
(iii) Nutter	29	68	66	146
(iv) Seton	14	52	63	165
(v) Shimkin-Leedy	23	63	68	165
(vi) Kaplan-Moorsteen	27	67	71	158
1. Machinery				
(i) Nutter	13	56	42	125
(ii) Shimkin-Leedy	7	38	32	147
(iii) Kaplan-Moorsteen	7	41	34	136
2. Other Producers' Goods				
(i) Nutter	24	65	68	154
(ii) Shimkin-Leedy	17	61	70	163
(iii) Kaplan-Moorsteen	21	67	72	160
3. Consumers' Goods				
(i) Hodgman	39	92	87	—
(ii) Nutter	56	86	93	161
(iii) Shimkin-Leedy	55	87	91	168
(iv) Kaplan-Moorsteen	54	89	98	170

Sources: Hodgman [1, pp. 89, 123, 134]; Jasny [2, p. 57]; Nutter [7, pp. 402, 404–5]; Seton [12, p. 30]; Shimkin-Leedy [13, p. 7]; Kaplan-Moorsteen: Table 1 above. We ignore here the difference between the calendar year 1928, and the fiscal year 1927/8 (Oct. 1, 1927–Sept. 30, 1928).

weighted aggregation of output series but is obtained from a few selected series, regarded as inputs, and a regression equation, relating such inputs and output from data for other countries.

In other cases, however, no ready explanation of the differences is available. The indexes do differ in weights: Shimkin-Leedy use a "modification" of Hodgman's 1934 wage-bill weights, Nutter a combination of 1955 prices and employment distributions, and Jasny "real 1926/27 prices." Though there are considerable areas of agreement among the Shimkin-Leedy indexes, the Nutter indexes, and ours, there are also appreciable and conspicuous differences. If the major differences among these indexes were differences in the *date* of the weights, two consequences would ensue: (a) our results and Nutter's should coincide quite closely, for the difference between 1950 and 1955 weights should yield insignificant differences in the results; and (b) our results should show substantially smaller increases than the Shimkin-Leedy indexes on the grounds that early-year weights (such as 1934) typically produce a more rapidly growing index than do late-year weights (such as 1950 or 1955). Yet our postwar results for all categories of output are closer to the Shimkin-Leedy than to the Nutter indexes, and in the 1927/28-1950 period our results for machinery are almost identical with the Shimkin-Leedy index but far different from the Nutter index.

It is clear that an explanation of the differences in results requires detailed comparisons of the individual output series, weights, and various adjustments employed. Both limitations of space and the absence of published details (including as yet those which underlie our machinery component) make such comparisons infeasible here. Until such comparisons are undertaken, our results and the subsequent applications we make of them should, for these reasons also, be regarded as tentative.

Let us turn now to the comparisons between our results and the official indexes in Table 3. For the 1928-1950 period and for all commodity groups, the official indexes and ours bear essentially no resemblance to each other beyond the fact that both record increases in output: the official indexes show increases from 1928 to 1950 which are from 2½ to 6 times the increases shown by the corresponding Kaplan-Moorsteen indexes. These divergences are not surprising. In the 1928-1950 period, the official indexes are the 1926/27 ruble indexes which should yield increases substantially greater than ours for at least two reasons: (a) the official weights are, in principle, 1926/27 prices which, referring to an essentially "preindustrialization" economy, yield greater increases in output than an index constructed with weights of a recent year; and (b) in the 1928-1950 period, new products were often introduced into the index at essentially current prices—and, because of inflation, higher

prices—rather than 1926/27 prices, thus imparting an upward bias to the official index. In addition, the official indexes for all industrial products and machinery include, and ours exclude, munitions; and the output of munitions in 1928 was negligible.

Though the divergences themselves are not surprising, three points perhaps deserve some emphasis. First, the divergences pervade all commodity groups in Table 3. Secondly, if the official and Kaplan-Moorsteen indexes for the 1928-1950 period are broken down into subperiod indexes—i.e., 1937 indexes with 1928 = 100, 1940 indexes with 1937 = 100, and 1950 indexes with 1940 = 100—the divergences pervade all commodity groups and all subperiods, except machinery in the 1940-

TABLE 3—COMPARISONS BETWEEN KAPLAN-MOORSTEEN AND OFFICIAL INDEXES[a]
(All Indexes with 1950=100)

	1928	1937	1940	1945	1950	1953	1955	1957	1958
All Industrial Products									
(i) Official (including munitions)[b]	9	40	58	53	100	145	185	225	247
(ii) Kaplan-Moorsteen (excluding munitions)	27	67	71	37	100	130	158	188	202
1. Machinery									
(i) Official (including munitions)[b]	2	27	47	60	100	159	217	279	318
(ii) Kaplan-Moorsteen (excluding munitions)	7	41	34	14	100	111	136	175	185
2. Other Producers' Goods									
(i) Official[c]	9	40	52	46	100	139	174	208	—
(ii) Kaplan-Moorsteen	21	67	72	43	100	131	160	190	207
3. Consumers' Goods									
(i) Official[b]	20	61	81	48	100	144	176	208	224
(ii) Kaplan-Moorsteen	54	89	98	40	100	143	170	195	206
a. Foods									
(i) Official[d]	25	78	104	52	100	138	160	192	202
(ii) Kaplan-Moorsteen	67	105	109	49	100	136	157	180	188
b. Nonfoods									
(i) Official[d]	26	67	89	55	100	143	178	200	218
(ii) Kaplan-Moorsteen	46	79	91	34	100	147	179	205	217

[a] The comparisons here, and others, for years through 1955 are found in [4, Table 27]. For further details see [4, notes to Table 27, and Section 4.3]. We ignore here the difference between the calendar year 1928 and the fiscal year 1927/8.

[b] For all industrial products, machinery, and consumers' goods, the official indexes for, respectively, gross industrial output, machine-building and metal-working output and group B output are used. They are found in [16, pp. 10, 32, and 37], and, for 1957 and 1958, in [15, p. 146].

[c] For other producers' goods, the official indexes are of two kinds. (a) In the 1928–1950 period the indexes are obtained by subtracting in each year the value of machine-building and metal-working output in 1926/27 rubles from the value of group A output in 1926/27 rubles. (b) In the 1950–1957 period, the indexes are obtained as averages of official indexes for relevant branches of industry, weighted by *our* wage-bill weights for those branches. The official branch indexes are found in [15, p. 140].

[d] The official indexes for foods and nonfoods are the official indexes for the food and light industries, respectively, from [15, p. 140] and [11, Jan. 16, 1959].

1950 period [4, Table 28]. Thirdly, the entire divergence observed should not be attributed to the "upward bias" of the official indexes if, by "bias," statistical malpractices such as the treatment of new commodities are meant. Part of the divergence, though a quantitatively unknown part, is explainable by differences between the official and Kaplan-Moorsteen indexes in weights and in coverage; nevertheless, a more detailed analysis of specific differences indicates that substantial "upward bias" exists, i.e., quantitatively important statistical malpractices are involved [4, pp. 97-102].

Contrary to their behavior in the 1928-1950 period, the official indexes and ours are, in general, not dissimilar in the 1950-1958 period. Only the machinery indexes exhibit a divergence which is reminiscent of the 1928-1950 behavior. Even so, appreciable divergences between the indexes persist in the 1950-1958 period; the official indexes tend to exceed ours; and the ratio of the official index to ours tends to increase over time.

Though in the 1950-1958 period the official indexes abandoned the use of 1926/27 price weights, the official indexes still differ from ours in several respects: (a) The official indexes for all industrial products and machinery include munitions. (b) The official indexes are price-weighted aggregates of gross output; in the 1950-1955 period, Jan. 1, 1952 prices are used, and in the 1955-1958 period, July 1, 1955 prices. (c) The official indexes are comprehensive in coverage, whereas ours refer only to a limited set of commodities. (d) The official indexes still appear to suffer from methodological shortcomings; for example, from official methodological statements it is quite possible to infer—though not with certainty—that the treatment of new products continues to impart an upward bias to the official index in the post-1950 period [12, pp. 4 ff.].

On the point of weight differences, two comments are necessary: First, for the post-1950 period, the differences in weight years are probably of limited significance, as the intervals between weight years are short and the changes in industrial price structure known to have occurred are limited. Secondly, the difference between the official set of price weights and our heterogeneous set of price, retail sales, and wage-bill weights also appears to be of limited significance at least for the 1950-1955 period. We have taken official indexes for branches of industry—ferrous metals, meats, cotton fabrics, etc.—and aggregated them by means of *our* weighting system into indexes for foods, consumers' goods, all industrial products, etc., and compared the results with official indexes for the more aggregative categories [4, Table 26]. Both our retail sales weights and our wage-bill weights yield results which are very close to the relevant official indexes. Hence it appears

that we can compare the official indexes and ours for the post-1950 period without particular concern about the disturbing effects of differences in weights.

On the point of differences in coverage: First, our inadequate coverage of the proliferation of new machinery models in the post-1950 period and other evidence lead us to the belief that our machinery index significantly understates the actual increase in output. Secondly, it is not clear whether the commodities omitted by us increase, on balance, more or less rapidly than those included [4, Tables 4 and 25, pp. 107-10].

Finally, with respect to official statistical malpractices, we have compared the official indexes for branches of industry—e.g., ferrous metals, textiles, etc.—with corresponding aggregations of our physical output series [4, Table 29] [6, Ch. 7]. In a number of cases such comparisons could be made for branches which appear to be well covered by our physical output series and which are believed to include no munitions. In some of these cases, the output increases shown by the official branch indexes and by our aggregations correspond very closely or exactly. In many cases, however, the official branch indexes show appreciably larger increases which, in the absence of other information, suggests the existence of an upward bias in the official index.

Thus, there are a number of reasons to expect the official indexes and ours to diverge in the 1950-1958 period.[7] The official indexes for all industrial products and machinery should (a) differ from ours because of the inclusion of munitions in the former and (b) exceed ours because of our inadequate coverage of new machinery models.[8] All the official

[7] Also, the categories for which the comparisons in Table 3 are made do *not* have the same meaning in the official and in the Kaplan-Moorsteen indexes. In addition to the difference in coverage of munitions, the following differences are notable: (a) the official index for machinery includes consumers' durables and certain kinds of repairs, whereas our indexes exclude repairs entirely and include consumers' durables in nonfoods; (b) the official index for consumers' goods is the group B index and, hence, excludes a number of commodities which, with further fabrication, eventuate as consumers' goods—notably, textile fabrics —and which are included in our consumers' goods index; and (c) the official index for nonfoods is the light industry index which excludes consumers' durables. However, consumers' durables and repairs are relatively unimportant. And in our index textile fabrics stand for sewn goods output which is otherwise absent. Hence, on the assumption that textile fabrics are a reliable surrogate in this respect, the only significant difference among those enumerated is the difference in the treatment of munitions.

[8] These divergences may be explored in terms of employment and productivity increases in the 1950-1958 period. The increase in man-years of employment in machine-building and metal-working was about 36.7 per cent during 1950-1956 [4, Table 45] and about 8.7 per cent during 1956-1958 [15, p. 133]; i.e., the increase for 1950-1958 was roughly 48.6 per cent. Over the same interval, 1950-1958, the increase in output per man-year for workers in all industrial branches *other* than machinery and metal-working amounted to about 48.1 per cent (see Table 7 below). Thus, if the increase in productivity in machinery and metal-working was the same as in the other industrial branches, the 1958 output index (1950 = 100) would be 220 for machinery and metal-working and 210.9 for all industrial

indexes should (a) differ from ours because of differences in coverage, and (b) exceed ours because of the apparent existence of methodological shortcomings in the official indexes. Without additional information, however, it is impossible to assess the relative importance of the various reasons for divergence.

B. *Major Trends in the Annual Rates of Growth*

Table 4 presents the average annual rates of increase of industrial output, as implied by our indexes, over various periods from 1927/28 to 1958. The major trends in growth rates are as follows:

1. In the prewar years, the rates of increase for all industrial products decline slightly from 1927/28-1932 to 1932-1937, reflecting very substantial declines in the rate of increase for machinery and other producers' goods and a very substantial increase in the rate of increase of consumers' goods. In the 1937-1940 period, marked by intensive rearmament, the rate of increase for all industrial products is very modest, less than one-fifth the previous rates of increase; machinery output actually decreases over this period and the rates of increase for other producers' goods and consumers' goods are substantially below the 1927/28-1937 rates.

2. The war years, of course, saw a very large decline in civilian output—a decline of about 50 per cent from 1940 to 1945 in all industrial products, 60 per cent in machinery and consumers' goods, and 40 per cent in other producers' goods (see Table 1). Following these declines, the early postwar period shows unprecedentedly high rates of increase in all major categories of output. By 1948 the prewar levels of output were reattained for all industrial products, machinery and other producers' goods, though consumers' goods did not reach the 1940 level until 1950 and foods not until 1951 (Table 1).

3. In the 1950-1958 period, the rates of increase for all major categories of output decline sharply as against the immediately postwar rates. In comparison with the 1927/28-1940 rates, the 1950-1958 rates

products, including munitions. (The latter index is obtained by combining the machinery and munitions index just described with the Table 1 indexes for other producers' goods and consumers' goods, weighted by the wage-bill distributions *inclusive* of munitions in [4, Table 7].)

In other words, the assumption of equal productivity increases yields an index for all industrial output somewhat greater than ours (which stands at 202 in 1958) but substantially less than the official (which stands at 247 in 1958). On the other hand, the official machinery and metal-working output index, taken with the increase in employment indicated just above, implies a 1950-1958 productivity increase for the branch of over 10 per cent per year, double that for the rest of industrial output. While it seems possible for productivity in machinery and metal-working to have increased somewhat more rapidly than in the rest of industry, the rate of increase implied by the official index is so large as to suggest that differences with respect to munitions and new machinery models are not the sole explanation of divergences between the official machinery index and ours.

TABLE 4—AVERAGE ANNUAL RATES OF INCREASE OF INDUSTRIAL OUTPUT *
(Percentages)

	1927/28–1932	1932–1937	1937–1940	1945–1950	1950–1953	1953–1955	1955–1958	1927/28–1940	1940–1950	1950–1958	1927/28–1958
All Industrial Products	10.6	10.1	1.9	22.3	9.2	10.1	8.6	8.2	3.5	9.2	6.9
1. Machinery	28.2	16.0	Decrease	49.0	3.7	10.6	10.7	14.1	11.3	8.0	11.6
2. Other producers' goods	16.5	10.1	2.5	18.4	9.5	10.5	8.9	10.3	3.4	9.5	7.8
a. Ferrous metals	11.0	22.0	1.0	18.2	12.0	9.3	6.5	12.7	3.9	9.2	8.8
b. Fuels	15.6	9.1	5.8	12.9	9.2	13.4	13.1	10.5	3.2	11.7	8.3
c. Electric power	26.3	21.8	10.1	16.1	13.8	12.5	11.1	20.3	6.6	12.5	13.5
d. Chemicals	24.9	23.7	2.4	31.5	9.2	12.7	9.0	18.7	5.9	10.0	12.0
e. Lumber, wood products and paper	17.5	5.1	2.6	18.7	6.4	7.4	5.2	8.6	2.4	6.2	5.9
f. Building materials	17.7	14.0	Decrease	30.9	14.5	12.6	11.0	10.4	4.7	12.7	9.1
3. Consumers' goods	2.1	8.5	3.3	20.0	12.6	9.2	6.5	5.0	0.2	9.4	4.5
a. Foods	1.2	8.2	1.5	15.1	10.9	7.3	6.2	4.1	Decrease	8.2	3.5
b. Nonfoods	3.0	8.6	4.8	23.8	13.7	10.3	6.6	5.7	0.9	10.2	5.2

* These are average annual rates of increase compounded annually over the indicated period. Calculated from the data underlying the indexes in Table 1, they may not quite coincide with the average annual rates of increase implied by these indexes which have been rounded to one decimal place.

are smaller for machinery and other producers' goods and larger for consumers' goods and all industrial products. In comparison with the 1927/28-1937 rates, the 1950-1958 rates are smaller for all industrial products, machinery, and other producers' goods and larger for consumers' goods; however, correction of the indicated understatement of the post-1950 growth of machinery output might be sufficient to remove or reverse the observed inequality in the 1927/28-1937 and 1950-1958 rates of increase for all industrial products.

4. Over the 1927/28-1958 period as a whole, by far the largest annual rate of increase among the major categories of output is that for machinery and by far the smallest is that for consumers' goods. This serves to place the 1950-1955 behavior of consumers' goods output in proper perspective: the increase in output for consumers' goods exceeded that for machinery and other producers' goods in the 1950-1955 period but *not* in the 1927/28-1940, 1940-1950, or 1955-1958 period.

5. Of some current interest is the question whether annual rates of increase have tended to decline since 1950. There is no evidence of retardation within the 1950-1955 period: the average annual rates of increase for all industrial products, machinery and other producers' goods are larger in 1953-1955 than in 1950-1953. There is, however, evidence of retardation in 1955-1958: (1) the 1955-1958 average annual rate of increase is less than the 1953-1955 rate for each of the commodity groups presented in Table 4 except machinery for which the rates are approximately the same; and (2) for all industrial products, producers' goods other than machinery, and consumers' goods, the 1955-1958 rates of increase are also less than the 1950-1953 rates. There is, however, considerable fluctuation in the annual increases for all industrial products and for the separate commodity groups. Calculated from the indexes in Table 1, the annual increases in all industrial products are (in percentages):

1953	*1954*	*1955*	*1956*	*1957*	*1958*
9.6	10.2	10.1	8.6	9.7	7.4

Thus, the observed decline in rates of increase within the 1953-1958 period is neither monotonic nor, except for 1958, substantial.[9]

[9] The official index for all industrial products (which includes munitions) exhibits the following annual rates of increase (in percentages):

1953	*1954*	*1955*	*1956*	*1957*	*1958*
11.8	13.3	12.4	10.6	10.0	9.7

[15, pp. 135, 137]. Thus, the official indexes also show a retardation in growth within the 1953-1958 period; but the marked decline in the 1958 annual increase fails to appear in the official data. One important factor which contributes to the 1958 retardation as measured by us is a very large decline in the 1958 machinery growth rate. Given the lack of information on the behavior of munitions output during this period and the limitations of our calculation for civilian machinery, one should not make much of this single year's variation in our index for all industrial products.

C. *Indications of Future Rates of Growth*

What does the seven-year plan, covering the 1959-1965 period, suggest with respect to future rates of growth in comparison with recent past rates of growth? Unfortunately, the physical output goals stated in the plan cover substantially fewer commodities than those underlying the indexes in Table 1. Hence, in order to discuss future versus past rates of growth, it is necessary to construct new indexes of output for 1950, 1955, 1958, and 1965(P),[10] which cover those commodities for which there are published 1965(P) goals and output series for the preceding years. The average annual rates of increase for 1950-1955, 1955-1958, and 1958-1965(P), which are implied by such indexes, are presented in Table 5. The underlying indexes require the following com-

TABLE 5—AVERAGE ANNUAL RATES OF INCREASE IMPLIED BY 1965(P) GOALS IN COMPARISON WITH RECENT RATES OF INCREASE[a]

(Percentages)

	1950–1955	1955–1958	1958–1965(P)	Percentage of 1950 Value of Commodities Included[b]
1. Machinery	7.0	8.2	9.2–10.7	34.3
2. Other producers' goods[c]	10.7	9.7	8.2– 8.8	85.3
3. Foods	8.8	12.1	8.6– 8.8	34.5
4. Nonfoods	11.9	6.3	6.4– 6.6	87.6

[a] The calculations underlying these results are summarized in [4, Table 37].

[b] The 1950 value of output or sales of the commodities included here divided by the 1950 value of output or sales of the commodities included in the corresponding indexes of Table 1.

[c] For other producers' goods, the aggregates are obtained as the sum of price times quantity data without the use of wage-bill weights for commodity groups within other producers' goods.

ments: (a) Their commodity coverage—particularly, in the cases of machinery and foods—is relatively small in comparison with the indexes in Table 1 (see last column of Table 5). (b) In the case of other producers' goods, commodity coverage is inadequate for lumber, wood products and paper, chemicals and building materials, though relatively high for ferrous metals, fuels and electric power [4, Table 36]. (c) Because of these coverage problems, the index for other producers' goods is a price-weighted aggregation of output series without any use of wage-bill weights. (d) Also because of these coverage problems, discussion is confined to foods, nonfoods, machinery, and other producers' goods separately. (e) Because the seven-year plan states a range of 1965(P) goals for many commodities, the indexes computed therefrom for 1965(P) and the implied 1958-1965(P) rates of increase also have a range.

[10] I.e., planned for 1965.

The average annual rates of increase in Table 5, taken as representative for the corresponding commodity groups, suggest the existence of a further decline in rates of growth in the seven-year plan as against the 1950-1958 period. Only for machinery is the 1958-1965(P) rate of increase substantially above the preceding rates. For other producers' goods and foods, the 1958-1965(P) rates are substantially below the 1955-1958 rates, and for nonfoods the rates are about equal. For other producers' goods and nonfoods, the 1958-1965(P) rates are substantially below the 1950-1955 rates; and for foods the rates are about equal.

The conclusion that future rates of growth will be less than those in the immediate past is subject, however, to at least two qualifications: First, the coverage of foods, machinery, and some commodity groups within other producers' goods is so inadequate as to cast doubt on the representativeness of the rates of growth calculated in Table 5; indeed, it is precisely in foods and machinery that the 1950-1958 rates of growth in Table 5 diverge markedly from those in Table 4 implied by our indexes with more comprehensive coverage. In support of retardation, however, are the official indexes which show 1958-1965(P) rates of growth less than both 1950-1955 and 1955-1958 rates of growth for all industrial output and for each of the major components thereof.[11]

Secondly, the conclusion assumes no overfulfillment of the output goals of the seven-year plan. There are, however, several indications of expectations to overfulfill. The Soviet press has reported "spontaneous" promises by individual plants and regions, frequently followed by Central Committee decrees of encouragement, to fulfill the 1965 goals in 1964 and, sometimes, in 1963.[12] Furthermore, some Soviet economists in analyzing the seven-year plan find substantial "reserves" towards overfulfillment.[13] Also, an October, 1959 decree called for increased

[11] The official annual rates of increase in percentages are:

	1950-1955	*1955-1958*	*1958-1965(P)*
All Industrial Output	13.1	10.2	8.8
1. Group A Industry	13.7	11.2	9.2–9.4
a. Machine-building and Metal-working	16.8	13.7	10.4
2. Group B Industry	12.0	8.2	7.1–7.4

The 1950-1955 rates are calculated from indexes in [16, pp. 10, 32, 37]. The 1955-1958 rates are calculated from indexes in [15, p. 146]. The 1958-1965(P) rates are calculated from indexes in [11, Feb. 8, 1959]. As before, all are average annual rates of increase, compounded annually over the indicated periods.

[12] E.g., see [11, June 11, June 18, June 23, 1959].

[13] For examples, see [14] and [5]. Also, in the last few years there has been a tendency for planned annual rates of increase of industrial output to be exceeded according to the official indexes [11, Feb. 6, 1957, Jan. 27, 1958, Dec. 20, 1957, Jan. 16, 1959, Dec. 23, 1958, Jan. 22, 1960]. Such claims are not always made [11, Dec. 27, 1955, and Jan. 31, 1957].

output of consumers' durables and items of household use over the 1959-1961 period and, thereby, fulfillment of the seven-year plan goals for these commodities before 1965.[14] Of course, these indications are too tenuous for predictive purposes. Nevertheless, if the 1965(P) goals are fulfilled a year earlier, the retardation inferred from Table 5 disappears. The 1958-1964 average annual rates of increase become: 10.1-10.3 per cent for foods, 7.5-7.7 for nonfoods, 10.9-12.6 for machinery, and 10.2-10.8 for other producers' goods. In the case of the official indexes, a similar conjecture yields 1958-1964 average annual rates of increase which are (a) on the average, equal to the 1955-1958 rates, but (b) less than the 1950-1955 rates.[15]

D. *An Index of Final Products*

In addition to the indexes in Table 1, we have computed an index of the output of final industrial products—i.e., products which are components of final demand.[16] We have done so because of possible interest in three aspects of the results: (a) they may be of use as interpolating or extrapolating indexes for national product components; (b) they may be of interest in relating changes in the level of industrial activity to changes in industrial deliveries of final products; and (c) the consumers' goods component, when related to population changes, serves as a measure of the changing contribution of industry to living standards.

The index (Table 6) includes the following commodity groups: machinery, building materials and consumers' goods. Of course building materials are not final products, strictly speaking, but are inputs to con-

[14] See [11, Oct. 16, 1959]. The decree calls for a 13 per cent average annual increase in 1958-1960 and a further 12 per cent increase in 1961 in the production of consumers' durables and housewares. Though our indexes do not cover all such commodities, we do have data on many. If we construct an output index for those items for which we have output series, the implied average annual rates of increase are 23 per cent in 1950-1953, 30 per cent in 1953-1955, and 6 per cent in 1955-1958. See [4, Table 3 and p. 130, fn. 1]. The index for consumers' durables and housewares increases much more rapidly than that for all nonfoods in the 1950-1955 period and somewhat less rapidly than that for all nonfoods in the 1955-1958 period. Thus, it appears that the decree in question is an attempt to improve a sector which in the 1955-1958 period failed by far to maintain the 1950-1955 annual rates of increase and that the original seven-year plan goals for this sector implied something much closer to the 1955-1958 rates of increase as against the 1950-1955 rates.

[15] Thus, the official rates of increase for 1958-1964 become (in percentages):

All Industrial Output	10.3
1. Group A Industry	10.8–11.1
a. Machine-building and Metal-working	12.2
2. Group B Industry	8.4–8.7

For the corresponding 1950-1958 rates of increase, see footnote 11 above.

[16] For the details of this calculation and for further discussion of the index, see [4, Section 4.5].

TABLE 6—INDEX OF OUTPUT OF FINAL PRODUCTS OF INDUSTRY[a]
(1950=100)

	1927/28	1932	1937	1940	1945	1950	1955	1958	Weight for Commodity Group[b] (Percentage)
All Final Products	37.3	45.9	74.0	75.6	31.5	100.0	158.6	200.8	100
1. Capital goods	9.3	23.3	47.4	40.2	16.2	100.0	147.5	200.6	42.0
a. Machinery	6.8	19.5	40.9	34.3	13.6	100.0	136.2	185.0	33.3
b. Building materials	18.8	37.6	72.3	62.9	26.0	100.0	190.4	260.5	8.7
2. Consumers' goods	57.6	62.2	93.2	101.2	42.6	100.0	166.7	201.0	58.0

[a] See [4, Table 40 and pp. 135–41] for the details of the calculation and for postwar annual values of the index of final products.

[b] Since an index of final products should have gross-value rather than value-added weights, we have reweighted the subindexes as follows: (1) The consumers' goods component is obtained by weighting the indexes of foods and nonfoods from Table 1 by the 1950 retail sales of each. (2) The machinery and building materials components are the indexes in Table 1—i.e., each with Jan. 1, 1950 wholesale price weights. To obtain the capital goods index the machinery and building materials indexes are weighted by the 1950 value of output for the two groups as computed in the present study—i.e., without imputations. (3) The resulting indexes for capital goods and consumers' goods are combined into an index of all final products by weights derived, with difficulties and uncertainties, from official gross value of output data.

struction activities whose outputs are final products. In the absence of direct measures of construction output at constant prices, others have used materials inputs as an indirect measure and it is in this sense that we include building materials as final products of industry.[17]

The index omits a number of important construction materials—notably, sawn wood and metals used in construction. If we substitute for our building materials index Raymond P. Powell's more comprehensive index of construction materials inputs and increase the weight assigned to construction materials accordingly [9], the index of all final products is essentially unchanged, while the capital goods index for the 1927/28-1950 period is changed substantially and shows a much smaller increase in output [4, pp. 142-43].

If we compare the index of final products with a similarly weighted index of all industrial products[18]—so that the only difference between

[17] For a materials inputs index of the volume of construction, see [10]. For a discussion of this type of index and of alternatives, see [3] and [8].

[18] I.e., an index of producers' goods other than machinery is obtained with Jan. 1, 1950 price weights throughout, and this index is combined with the consumers' goods and machinery indexes in Table 6 using the weights shown there. This gross-value weighted index differs only slightly from the value-added weighted index of all industrial products in Table 1 [4, pp. 144-45].

the two indexes is the inclusion of "intermediate products" in the latter —the two indexes move quite closely together in the 1950-1955 and 1955-1958 periods, but the final products index shows a much smaller increase over the 1927/28-1950 period than the index of all industrial products. Though these results suggest a more rapid increase for intermediate products than for final products in the 1927/28-1950 period and approximately proportionate increases in the 1950-1958 period, they should not necessarily be interpreted as indicative of changing structural relationships within Soviet industry. The results omit from consideration one additional commodity group—agricultural products consumed in industry, primarily in the production of consumers' goods —which (a) undoubtedly increased much less rapidly than intermediate products in the 1927/28-1950 period, and (b) increased very substantially in the 1950-1958 period.

Dividing the consumers' goods index in Table 6 by a population index [4, Table 41], we obtain the following index of per capita consumers' goods output:

1927/28	*1932*	*1937*	*1940*	*1945*	*1950*	*1955*	*1958*
69.9	70.8	102.9	93.7	45.4	100.0	153.6	177.4

This index shows essentially no change in the per capita output of consumers' goods between 1927/28 and 1932, a substantial increase between 1932 and 1937, an appreciable decline between 1937 and 1940, recovery beyond the 1940 level by 1950 but not yet to the 1937 level, and substantial increases between 1950 and 1955 and between 1955 and 1958. At best, however, this index measures not living standards but the contribution of industry to living standards. Omitted are a number of important elements of Soviet consumption: services, consumption in kind, direct sales by agriculture to households. If we confine our attention to the commodity component of living standards and examine the available data on consumption in kind and direct sales to households, both omissions appear to result in the same direction of error in the index of per capita consumers' goods output. On both counts, the "true" change in the commodity component of living standards between 1927/28 and later peacetime years appears to be either a smaller increase than our index indicates or a decrease [4, pp. 148-50].

E. *Changes in Productivity*

Table 7 presents estimates of changes in employment and in output per man-year for consumers' goods and producers' goods other than machinery.[19] The estimates require the following comments:

[19] Details of these calculations and a fuller statement of the underlying rationale and argument are found in [4, Sections 4.61 and 4.62].

TABLE 7—INDEXES OF EMPLOYMENT AND OUPTUT PER MAN-YEAR FOR PRODUCERS' GOODS OTHER THAN MACHINERY AND CONSUMERS' GOODS
(1950=100)

	1927/28	1932	1937	1940	1955	1956	1958
Indexes of Employment							
1. Producers' goods other than machinery	31.7	56.8	59.6	69.0	124.4	127.3	—
2. Consumers' goods	62.6	66.2	90.2	97.5	129.3	131.9	—
3. Consumers' goods and producers' goods other than machinery	43.6	60.5	71.6	80.2	126.3	129.1	137.6
Indexes of Output per Man-Year							
4. Producers' goods other than machinery	68.7	74.1	112.5	103.8	127.5	134.1	—
5. Consumers' goods	86.7	89.6	98.8	100.8	131.7	139.6	—
6. Consumers' goods and producers' goods other than machinery	79.3	80.8	105.8	102.4	129.2	136.3	148.1

Source: The employment and productivity indexes are from [4, Tables 45 and 46, and p. 168].

1. The productivity indexes are the conventional kind: indexes of output divided by indexes of employment. For this measure, however, the output indexes used are not quite the same as those in Table 1. We have substituted employment for wage-bill weights wherever the latter are used in Table 1. This enables us to interpret the reweighted output indexes as indicators of labor requirements for the given year's output with base-year (1950) labor productivity. The ratio of this magnitude to the labor actually required—i.e., to the index of actual employment—is a measure of the change in labor productivity between the base and given years.

2. Our estimates refer only to consumers' goods and producers' goods other than machinery. They are limited in this manner because: (a) the employment data available for the machine-building industry include both civilian machinery and munitions employment, whereas the output data refer only to civilian machinery; and (b) productivity calculations for all industry are quite sensitive to this distinction. Although we are unable to distinguish with precision that portion of total employment in machine-building which is devoted to civilian output, we have attempted illustrative calculations based on alternative assumptions about the distribution of employment. These suggest: (a) that over the 1927/28-1937 period, the increase in output per man-year for *all* civilan output (i.e., including civilian machinery, other producers'

goods and consumers' goods) was about the same as that for other producers' goods and consumers' goods; and (b) that over the 1927/28-1950 period, the increase in output per man-year for all civilian output was considerably greater than that for other producers' goods and consumers' goods. We are unable to make similar calculations for the post-1950 period.

3. The employment series refers to man-years worked by direct production workers. Since, at least since 1932, *total* employment in industry —i.e., man-years worked by direct production workers, maintenance personnel and white-collar workers and technicians—appears to have increased less rapidly than employment of production workers [16, p. 23], our measures appear to understate the increase in productivity for the more comprehensive group of employed persons. Also, the number of hours worked per year has tended to decline over the 1927/28-1932 period, to increase over the 1932-1950 period, and to remain about constant thereafter; thus, for the pre-1950 period, output per man-hour changes somewhat differently from output per man-year.

4. The employment indexes are also subject to errors, the most important of which is the following: Employment in small-scale industry accounts for about 30 per cent of our estimated total in 1927/28 and about 18 per cent in 1932. The underlying data on small-scale industry employment are sufficiently ambiguous to yield the possibility of appreciable error in our employment and productivity estimates for those years.

With the foregoing qualifications in mind, let us turn to the productivity trends which emerge from Table 7: (1) During the prewar period, there were modest increases in productivity from 1927/28 to 1932, substantial increases from 1932 to 1937, and small changes in both directions from 1937 to 1940. For the prewar period as a whole, output per man-year increased much more rapidly for producers' goods than for consumers' goods. (2) The productivity indexes move uniformly upward in the post-1950 period, the increases for consumers' goods exceeding slightly those for producers' goods. In 1950, however, output per man-year was still below the peak prewar levels, and this in spite of a substantial increase in hours worked per year. (3) For the 1927/28-1958 period as a whole, output per man-year has increased by about 87 per cent, an increase compounded from a 33 per cent increase between 1927/28 and 1937 (the peak prewar year) and a 40 per cent increase between 1937 and 1958. Judging from the 1927/28-1956 data, the increase for producers' goods is substantially greater than that for consumers' goods.

The average annual growth rates in employment and output per man-

year for producers' goods other than machinery and consumers' goods are as follows (in percentages):

	1927/28–1932	*1932–1937*	*1937–1940*	*1927/28–1940*	*1950–1955*	*1955–1958*	*1950–1958*
Output per Man-Year	0.4	5.5	decrease	1.9	5.3	4.7	5.0
Employment	8.0	3.4	3.9	5.0	4.8	2.9	4.1

In the post-1950 period, the rate of productivity increase declines between 1950-1955 and 1955-1958, but only slightly, and is substantially higher than that for the prewar period as a whole. In the post-1950 period, the rate of employment increase declines appreciably and is below that for the prewar period as a whole. Thus, our calculations show: (1) no general trend toward retardation in the growth of productivity within the prewar period or as between the prewar and postwar periods, and (2) a slight, possibly insignificant, retardation within the postwar period. They suggest as well that the productivity growth rates may have been supported by a tendency toward decline over time in the rate of increase of employment.

The seven-year plan implies a further decline in the future rate of productivity increase. It suggests, without clearly indicating, that the number of industrial workers is to increase by about 3.2 per cent per year in the 1958-1965 period, as compared with the 3.3 per cent rate at which employment in all branches of industry, including machine-building, grew during 1955-1958.[20] Since the seven-year plan output goals imply a significant decline in 1958-1965 rates of increase relative to the 1955-1958 rates, they also imply a rate of increase of labor productivity significantly below that realized during 1955-1958. Should the growth of productivity continue at about the 1955-1958 rate, the plan would be fulfilled ahead of schedule and the indicated retardation in the growth of industrial output would not occur. Perhaps this is one of the "reserves" for overfulfillment mentioned above.

It would be desirable to accompany the foregoing discussion of trends in labor productivity with a parallel discussion of trends in capital productivity and to obtain measures of changes in capital-labor ratios. Unfortunately, the only capital measures now available are the official series about which little is presently known. Since we are unable to vouch for the reliability of the capital series, about all we can do is to make explicit the relationships implied by the official capital series when compared with our employment and output indexes. Such com-

[20] For the seven-year plan data, see [11, Feb. 8, 1959], and also [4, pp. 175-76, fn. 1]. For 1955–1958, see [4, Table 45, and p. 168].

parisons for 1927/28, 1932, 1937, 1940, 1950, 1955, and 1957 yield the following highly tentative and provisional results:

1. The ratio of capital to labor has increased monotonically and substantially over the observed years from 1927/28 through 1957.[21]

2. The ratio of capital to output has increased (or capital productivity has decreased) monotonically and substantially over the observed years from 1927/28 through 1950, but the change is ambiguous from 1950 through 1957.[22]

[21] See [4, Table 49] for these comparisons through 1955. For the 1957 capital index, see [15, p. 59]. For the 1957 employment index see [4, Table 45]. Both the capital and employment indexes include factors engaged in munitions output; and hence, on this account, the observed changes in the capital-labor ratio are relatively reliable.

[22] See [4, Tables 22 and 49] and [15, p. 59]. Even if the official capital indexes are accepted as reliable, this comparison encounters a number of difficulties—especially, that the capital indexes include capital engaged in munitions output whereas the output indexes exclude munitions; and that the capital indexes appear to resemble chained rather than fixed-base index numbers. Thus to make the comparison more precise, one should include munitions in the output index and reweight the prewar output indexes with early-year weights. However, on examination of the resultant output increase which is necessary to yield a decrease in the capital-output ratio, it is still clear that the official capital series implies a substantial increase in the capital-output ratio from 1927/8 through 1950. In the post-1950 period, on the other hand, it is quite possible that inclusion of munitions output might have arrested or reversed the apparent increase in the capital-output ratio. For the underlying argument, see [4, Section 4.63].

A calculation of the change in the productivity of labor and capital combined over the 1927/8-1955 period, with hypothetical weights of ¾ for labor and ¼ for capital (and similarly for weights of 4/5 to 1/5 and 2/3 to 1/3), shows an increase in combined factor productivity from 1927/8 to 1940, from 1950 to 1955, and from 1927/8 to 1955. If, however, the weight of capital is increased to ½, then only the 1932-1937 and 1950-1955 periods emerge as periods with output increases clearly in excess of the increase in labor and capital combined. See [4, Table 50, and pp. 183-88].

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THE EQUALIZATION OF RETURNS AND REGIONAL ECONOMIC GROWTH

By GEORGE H. BORTS*

The possibility of interaction between resource earnings and regional growth patterns has been pointed out by many writers.[1] From one point of view, regional growth may be regarded as the outcome of resource movements generated by earnings differentials. In turn, these are caused by initial differences in regional endowments of capital and labor. The resulting pattern of regional growth represents an equilibrating process which will tend to eliminate geographic differences in the returns to resources.

From another point of view, the differentials in resource movements and regional growth patterns are not explainable either in terms of initial differences in the prices of resources or in resource endowments; instead, they are to be explained by a difference in production functions or in the demand for a region's exports.

In this paper I shall examine the empirical implications of these two approaches and try to identify the forces operating through regional growth patterns in the United States in the last four decades. In a sense neither framework offers a complete growth model. Each provides an explanation of the economy's adjustments to changes in tastes, technology, and the stocks of labor and capital. Nor are the two explanations inconsistent. It is conceivable that in some areas, investment is attracted by low real wages and a high marginal product of capital, while in other areas investment is explained by other considerations. It is the purpose of this inquiry to determine which of these relationships has been responsible for the observable growth differentials of the recent past.

The hypotheses to be examined are consistent with the assumptions of a competitive economy, with capital and labor mobile between regions. It is assumed that the total stocks of capital and labor are fixed in the short run, and expansible in the long run through accumula-

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[1] Statements of this problem may be found in articles by Hoover and Ratchford [5], North [10] [11], and Tiebout [11], [15].

tion and reproduction. It is not intended to explain growth in the country at large. National growth patterns will be taken for granted, and only regional differences will be examined.

I. *Relations between Growth and Returns to Resources*

A. *The Equalization of Returns to Resources*

A simple model of regional growth is first constructed wherein observable growth patterns are generated by initial disparities in resource endowment.

If we assume that each region produces the same single output with the same production function, those regions with the highest proportion of capital to labor will evidence the highest real wage and the lowest marginal product of capital. In a free market we would observe capital moving from high-wage to low-wage areas, with the consequence that the low-wage areas experience higher rates of growth of capital and of the return to labor. If the regional wage differentials were large enough initially, we might also observe labor migrating from the low-wage to the high-wage areas. This would yield the same equilibrating effect on the return to capital and labor, although the effects on the growth of output in each region would be somewhat different. Whether or not labor migrates, capital movements would produce an eventual elimination of regional differences in resource endowment, in the real wage, and in the marginal product of capital. The adjustments which this model describes are movements along the production function of each region.

The assumptions underlying the model are: (1) The total supply of labor to all regions taken together is fixed. The only way in which one region may employ more labor is through migration from other regions. (2) A single homogeneous output is produced in each region. (3) There are zero transport costs between regions so that the price of output is regionally uniform. (4) The same production function exists in each region, being homogeneous of degree one in the inputs labor and capital. (5) There are zero costs of converting output into capital goods.

Let $X = f(C, L)$ be the single, regionally uniform production function for output in general. L is the quantity of labor employed, C the physical quantity of capital employed, where C is the accumulated stock of past unconsumed outputs. The assumption of a production function homogeneous of degree one means that the marginal physical product of labor f_L, and the marginal physical product of capital f_C are both functions of the capital-labor ratio:

$$f_L = g(C/L); \qquad f_C = h(C/L).$$

Under these assumptions, if C/L is greater in region A than in region B, the real wage is higher in region A; i.e.,

$$g(C/L)_A > g(C/L)_B.$$

Further, the marginal physical product of capital is higher in region B,

$$h(C/L)_B > h(C/L)_A.$$

Under the assumption that output is homogeneous, and that there are zero costs of converting output into capital goods, the marginal efficiency of investment is h.[2] Therefore, capital will flow from region A to region B, and labor may flow from region B to region A.

This model abstracts from differences in production techniques due to the varying fertility and location of natural resources. Nevertheless, it provides a movement towards equilibrium and suggests two testable hypotheses. They are: (1) Low-wage regions will experience the highest rates of growth of capital, and of the ratio of capital to labor. (2) Low-wage regions will experience the highest rates of increase of wages.

The implications of the model will be contradicted if certain of the assumptions are contradicted. For example, in the long run the growth of the labor supply will differ among regions. If the supply of labor grows faster in low-wage regions and if labor is insensitive to regional wage differentials, different conclusions are suggested. Low-wage regions will still experience the highest rates of growth of capital, but they may not experience the highest rate of increase of wages; for the growth of the labor supply would prevent a rise in the ratio of capital to labor.

This problem also arises if we examine separate sectors of a region's economy. The supply of labor in the nonagricultural sector of a low-wage region may be increased through transfer of some of the region's labor force from agriculture. At the same time this sector may experience a very high rate of capital accumulation. However, the attraction of labor to the sector would prevent a rise in the ratio of capital to labor and in the real wage in the sector.

B. *Regional Growth and the Allocation of Resources*

The conclusions of the first model depend upon the assumption that a single uniform good is produced by each region. If we consider two

[2] In this simple model, the marginal efficiency of investment and the marginal physical product of capital are identical. This is due to the use of one output which can be consumed or accumulated, and a zero marginal cost of transforming output into capital goods. In the more complex models considered below the two concepts are not identical. The marginal physical product of capital is f_c. Assuming capital to be permanent and to yield a constant annual future income stream, the marginal efficiency of investment is a schedule showing for different levels of investment an ordinate whose value is $\frac{f_c \cdot P_o}{P_c}$ where $\frac{P_o}{P_c}$ is the ratio of the price of output to the price of capital goods.

output sectors in a region, different conclusions are possible. As will be shown, a high-wage region may then grow faster than a low-wage region. In addition, an increase in physical capital in one region may not yield a change in factor combinations and in factor payments, but instead a reallocation of the region's output in favor of the commodity produced by the capital-intensive sector.

These possibilities have been recognized by Samuelson in his work on factor price equalization [14]. He specifies sufficient conditions for interregional trade in two or more commodities to result in the equalization of factor prices. The conditions imply that a reshuffling of resources within each region is sufficient to eliminate the inducements for interregional factor movements. While regional growth differences might occur, they would not generate a pattern of differences in returns to resources. Nor would they be generated by such differences.

In the second model, I shall therefore assume empirical restrictions on the data which prevent factor price equalization from occurring through internal reallocation. These restrictions take the form of either: (a) regional differences in production functions, or (b) transport costs which prevent commodities from having the same relative prices in each region.

The model now to be presented is one in which growing regions may have higher real and money wages than declining regions. Let us assume that each region produces a positive quantity of commodities in each of two industrial sectors X and Y; and that the output of sector Y is transportable among regions while the output of sector X is not. Further, sector Y need not be identical among regions.

The money wage level in each region depends upon the marginal physical products of labor and the prices of output in the two sectors of the region; the marginal physical products of labor in turn depend on the ratio of physical capital to labor in the region and the composition of output. The same set of variables determines the marginal efficiency of investment in the region.

A region with low money wages may not grow faster than a region with high money wages because it may have a lower schedule of the marginal efficiency of investment.[3] It may have a lower schedule if its low wage level is due to a relatively low price of the commodity produced in its transportable sector, or is due to production functions

[3] Define the marginal efficiency of investment schedule for each region as a set of points showing values of $\frac{I_o \cdot P_o}{P_c}$ on the ordinate, while the abscissa shows the ratio of investment to the existing stock of capital. If the actual rate of return on investment is the same in all regions, then the region with the lowest schedule will have the lowest rate of growth.

which yield relatively low values of the marginal products of capital and of labor.[4]

We can now specify the conditions under which a region with high money wages will grow faster than a region with low money wages: (a) A higher marginal efficiency of investment in the high-wage region than in other regions. This could be due to either of two causes: (i) production functions in the high-wage region which yield higher marginal physical product schedules for both labor and capital;[5] (ii) a rise in the price of the region's export commodity relative to the export commodity of other regions. (b) For noneconomic reasons, population migrates to this region, and the migrants transfer capital with them; or the migrants demand capital once they have completed the move. (c) Residents of the region save a higher proportion of income than residents of other regions, and this is invested, for noneconomic reasons, in enterprises within the region. Any one of the above causes will lead to a rise in the region's income through the familiar investment income-generating process. The income boom will also lead to a passive current balance and a real transfer of capital from other regions.

This is likely to be true even if the income boom is caused initially by a rise in export prices. The export surplus will be short-lived, because it coincides with a rise in the region's marginal efficiency of investment. That is, the price of export goods rises relative to the price of capital goods which are either produced in the domestic sector or are imported. Unlike the traditional balance-of-payments multiplier, a secondary investment boom generates new income and a new demand for imports. While the initial impact of the exports boom is a favorable balance of payments with other regions, its eventual effect must be destabilizing with respect to the balance of payments if the region is to import capital.[6]

1. *Accumulation and the Increase in Wages.* There are two reasons

[4] Because each region need not produce the same transportable commodity, any particular region may suffer a decline in money wages if, for example, there is a decline in the demand for its product. In addition, a low-wage region might have a low marginal physical product of capital because the ratio of capital to labor is higher in each of its industries than in the high-wage region. This would imply a high marginal physical product of labor, but not necessarily a high money wage.

[5] In an analysis which deals with only two resources, labor and capital, it is reasonable to think of differences in production functions among regions, even though the "state of the arts" be widely disseminated.

[6] It is conceivable that one region may grow faster than other regions in a free-trade economy without importing capital. However, it is difficult to see why this should occur unless the residents of the growing region have an irrational demand for externally generated securities. The forces generating growth in the region should also generate a demand for the region's securities.

why a growing region will enjoy a rise in the money wage per worker: (a) The investment income-generating process leads to higher prices of goods in the two sectors X and Y and therefore to a higher marginal value product of labor. This will also represent a rise in the real wage, if the prices of goods imported into the region are now lower relative to the region's money wage. (b) The accumulation of capital may raise the marginal physical product of labor. To accomplish this, accumulation must raise the ratio of capital to labor in both output sectors. This requires that accumulation be accompanied by an increase in the price of output in the sector which is labor-intensive relative to the price in the sector which is capital-intensive.

With the aid of simplifying assumptions, it is possible to specify the conditions under which this will occur. Let us assume that: (1) production functions for the two outputs are homogeneous of degree one; (2) with given resources, there is a unique ratio of capital to labor for each production function which will yield a given marginal rate of substitution between the two products.

These conditions guarantee that factor proportions in the two sectors are unique functions of the relative prices of their outputs. A rise in the proportion of capital to labor in both sectors requires that there be an increase in the relative price of output in the labor-intensive sector. If during accumulation the relative prices of outputs remained unchanged, the factor proportions would not change. All that would happen would be a simultaneous reallocation of output in favor of the sector which is capital-intensive with no change in marginal physical products.

We must therefore restrict the demand conditions for the outputs of the two sectors. If accumulation is to raise the marginal physical product of labor, the demands for the two commodities must be such that the relative price of the labor-intensive commodity rises as the new capital is allocated to the two sectors. A graphic demonstration of these propositions is to be found in the Appendix.

2. *Accumulation and the Real Wage.* With the aid of a number of realistic assumptions, we may specify the effect of growth on the real wage. Let us assume that the products of the transportable sector (Y) of the region are capital-intensive while those of the nontransportable, domestic sector (X) are labor-intensive. For example, the capital-intensive sector may be thought of as manufacturing and mining, while the labor-intensive sector is services.[7] Further assume that the region is experiencing rapid growth because of upward shifts in the

[7] If we ignore transportation and communications, it appears reasonable to regard as relatively labor-intensive such activities as: wholesale and retail trade; finance, insurance, and real estate; services; and construction.

demand for the output of its export sector. The major cause of an increase in the real wage is the rise of money wages relative to the prices of commodities imported into the region. It is less certain that the real wage will be improved through an increase in the marginal physical product of labor. As we have seen, it requires an increase in the ratio of capital to labor in each industry. It is brought about by a rise in the price of the product of sector X relative to that in the Y sector. This might be due to the high income elasticity of demand for the product of the labor-intensive sector and to the respending of new income generated in the region. However, if this rise went far enough, it would offset any initial increase in the export price and would wipe out the higher marginal efficiency of investment generated by the export boom.[8] For if the growth process is to continue, there can be no rise in the marginal physical product of labor, as this would imply a fall in the marginal physical product of capital. If the marginal physical product of labor does rise, it will impede the growth process by leading to a lower marginal efficiency of investment.

The only exception to this would occur if capital goods were exclusively imported. For then we could have: a rise in the prices of both sectors of the region relative to the price of capital goods; a rise in the price of the labor-intensive domestic sector relative to the capital-intensive export sector; a rise in the marginal efficiency of investment, a rise in the marginal physical product of labor, and a fall in the marginal physical product of capital.[9]

This analysis permits us to understand how the real wage and the marginal efficiency of investment may simultaneously be higher than the national average in a growing region and simultaneously lower than

[8] In a two-community framework, the marginal efficiency of investment can be written as $\frac{P_y}{P_x} \cdot MP^y_x$, where P_y is the price of output, P_x the price of capital and MP^y_x the marginal physical product of capital in the Y industry. Let us assume that X, the labor-intensive domestic sector, produces capital goods. If resources are efficiently allocated between the two industries, the following condition holds:

$$\frac{P_y}{P_x} \cdot MP^y_x = MP^x_x.$$

By assumption, MP^x_x is a function of the capital-labor ratio in X. Therefore, a reduction in P_y/P_x (an increase in the relative price of the labor-intensive sector) raises the capital-labor ratio in X and Y, lowers the value of MP^x_x and MP^y_x and lowers the marginal efficiency of investment in the region. For a graphic demonstration, see the Appendix.

[9] Let Z denote the imported capital goods. Then the marginal efficiency of investment (MEI) is:

$$\frac{P_y}{P_z} \cdot MP^y_z = \frac{P_x}{P_z} MP^x_z$$

The values of these terms could rise due to an increase in the price ratios P_y/P_z, P_x/P_z. At the same time, P_y/P_x could be falling with the consequence that MP^y_z and MP^x_z would fall, although not so much that the MEI would decline.

the national average in a declining region. It has been shown that the real wage in the region depends upon the marginal physical products of labor and the prices of the region's outputs relative to the prices of its imports. The marginal efficiency of investment depends on the marginal physical product of capital in the region and the prices of the region's exports relative to the prices of domestically produced and imported capital goods. Even though the marginal physical product of labor is inversely related to the marginal physical product of capital through factor proportions, favorable movements of the relevant price ratios may raise both the real wage and the marginal efficiency of investment. The crucial assumptions underlying the analysis are either regional differences in production functions, or regional differences in the ratio of the prices of export goods to the prices of goods produced in the domestic sector.

From this analysis, it becomes clear that a region's growth depends strongly upon the behavior of the prices of its export sector. A high-wage region may grow more rapidly than a low-wage region if the demand for its export goods is growing. Because a high-wage region can produce a different export commodity than a low-wage region, the export boom of one region will not be shared by the other. A high-wage region may, therefore, have a greater growth of capital and a greater increase in money wages than a low-wage region. It may also have an increase in the marginal physical product of labor and in the real wage under the conditions specified above.

This model, therefore, allows conclusions which contradict the one-commodity model. For the one-commodity model implies that capital will grow faster in low-wage regions. Here we see that the opposite is possible. Capital may grow faster in a high-wage region. Further, if the elasticity of labor supply does not differ among regions, the money wage rate will increase fastest where capital is growing the fastest. If the money wage rate does not increase rapidly where capital is growing rapidly, then we may look to a high growth of employment as the explanation.

In the following sections these alternative frameworks will be tested against the experience among United States regions in the last four decades.

II. *Statistical Tests*

In order to subject the above hypotheses to test, it is necessary to measure the changes in capital, labor and wages among regions. In all cases, the regions examined are the forty-eight states. The time period runs from 1919 to 1953. This period is broken into shorter intervals marked by business-cycle peaks as the initial and terminal dates. The purpose is to measure growth as the change during each interval. Such

changes are independent of cyclical movements in the sense that intervening cyclical troughs do not influence the statistical measurement of growth from one peak date to the next. The intervals chosen are 1919 to 1929, 1929 to 1948, and 1948 to 1953.

The growth of capital in each state is measured by the growth of the income to capital.[10] We can think of the total income produced in the state as the sum of payments to wage and salary earners and to property owners. The percentage change in the income to property owners in the nonagricultural sector of each state is used to measure the change in the total return to capital in that sector in each state.[11]

Percentage changes in nonagricultural employment in each state are computed for the intervals 1919-1929, 1929-1948, and 1948-1953. For 1919 and 1929, the employment estimates are derived from the Census of Population [17] [19]. The employment data for 1948 and 1953 are estimates of the Bureau of Labor Statistics [23].

These sources are also used to derive estimates of employment by states in two nonagricultural sectors: (1) mining and manufacturing, and (2) a composite sector which I have called services. The services sector includes the following employment categories: wholesale and retail trade; finance, insurance and real estate; service and miscellaneous. This dichotomy excludes employees in construction, transportation, communication, public utilities and government. In 1950, these

[10] The total return to capital is the product of three elements: the number of physical units of capital, the marginal physical product of capital, and the price of the output produced by capital. In the two models presented above, capital is treated as a homogeneous physical commodity. In the first model, there is one good which can either be consumed or accumulated. In the second model, the capital good is either produced by the domestic sector of the region or imported. In the first model, increases in the quantity of capital employed would in all likelihood be accompanied by increases in the total return to capital. The exception would occur if the schedule of the marginal physical product of capital were inelastic in the range in which accumulation was taking place. In the second model, increases in the quantity of capital employed will be accompanied by increases in the total return to capital. There are two reasons for this: (a) The money return to capital will be increased by an increase in the prices of goods produced by capital. In a growing region experiencing an investment income-generating process, all prices are likely to be rising. In particular, the prices in the capital-intensive sector will rise due to an export boom. (b) The marginal physical product of capital will not fall rapidly, if it falls at all, because of the expansion of the scale of both the capital-intensive and labor-intensive sectors. Thus, increases in physical capital will be accompanied by slight if any declines in the marginal physical product of capital.

[11] For 1929, 1948, 1953, the payments to wage and salary earners and to property owners are derived from [22]; for 1919, from [7]. This measure of capital accumulation was checked for consistency against three other methods of estimation: (a) growth of corporate income after taxes generated by firms resident in each state; (b) growth of total assessed value of property by state; (c) growth of cumulative value of construction by state. For the periods under review, the estimates are close enough to permit reliance on the measure described above. An analysis of methods of estimating returns to capital will be presented by the author to the 1961 Conference on Research in Income and Wealth, in a paper entitled, "Problems on the Distribution of National Income by Regions."

excluded sectors made up approximately 30 per cent of employed nonagricultural workers.

The wage per employee in the two nonagricultural sectors is computed from the income and employment data previously mentioned. The wage change used is the percentage change in the wage income per employee between 1919 and 1929, 1929 and 1948, 1948 and 1953.

A. *The Growth of Wages, Capital, and Employment*

We may use the statistical data to test the hypotheses presented earlier: (a) Capital grows fastest in low-wage areas. (b) Wages grow fastest in low-wage areas unless growth of employment prevents a rise in the ratio of physical capital to labor.

Table 1 indicates for each time interval the average wage level and average percentage change in wages for groups of states classified by their position with regard to the median growth of employment and median growth of capital. This is shown for the nonagricultural sector of each state. For each interval the table shows n, the number of states; w, the average wage income per nonagricultural employee at the initial date; and $\dot{w}$, the percentage change in w. Also shown are the average values of w and $\dot{w}$ for the entire 48 states. If the data are consistent with the hypotheses, we should observe low values of w and high values of $\dot{w}$ in states with a high rate of capital growth. Also, in each interval the value of $\dot{w}$ in the lower left box should be higher than in the upper left box; further, the value of $\dot{w}$ in the upper right box should be lower than in the lower right box.

TABLE 1—LEVEL AND PERCENTAGE GROWTH OF WAGES IN 48 STATES CLASSIFIED BY GROWTH OF CAPITAL AND OF EMPLOYMENT, 1919–1929, 1929–1948, 1948–1953[a]

Time Interval:		1919–1929		1929–1948		1948–1953	
		High Capital Growth	Low Capital Growth	High Capital Growth	Low Capital Growth	High Capital Growth	Low Capital Growth
High Employment Growth	n	13	11	16	8	20	4
	w	$986	$970	$1051	$1355	$2799	$2320
	$\dot{w}$	16.24%	3.83%	161.73%	128.41%	30.99%	25.51%
Low Employment Growth	n	11	13	8	16	4	20
	w	$1074	$1017	$940	$1203	$2912	$2665
	$\dot{w}$	16.26%	11.75%	158.81%	127.93%	30.39%	26.80%
U. S. Average	w	$1011		$1134		$2713	
	$\dot{w}$	12.19%		144.42%		28.75%	

[a] n: the number of states; w: the average wage income per nonagricultural employee at the initial date; $\dot{w}$: the percentage change in w.

As the table indicates we frequently observe the contrary of these events. In two of the three periods, the states with a high rate of capital growth have high values of w. In the 1919-1929 interval, the state groups where capital grew fastest had on the average a wage 2 to 5 per cent greater than in the other states. In the 1948-1953 period, the state groups where capital grew fastest had a wage 10 to 20 per cent greater than the other states. In these same two periods, the fastest wage increase occurred among state groups with relatively high wages. Only in the 1929-1948 period do rate of capital growth and rate of wage increase appear greatest in low-wage states. Finally, the value of $\dot{w}$ does not appear to be influenced by the rate of employment growth. Only in the 1919-1929 interval does high employment growth appear to slow the increase in the wage.

This evidence casts considerable doubt on the hypothesis that low wages are a major influence on capital movements. Or, to put it another way, there is doubt that wage differentials are a prime influence on the marginal efficiency of investment. While it has been true over a long period that wages have tended towards equality among states, the strength of this movement appears markedly weaker in the past four decades.[12]

The strength of these convergence and divergence patterns may be seen in the following contingency table which covers the three periods examined. Table 2 classifies the states according to wage level and rate of wage increase. Shown at the bottom is the value of chi-square (χ^2) which has been computed for each time-interval as a measure of association.[13] There is a strong divergence pattern among states in the first period, a strong convergence pattern in the second period and no pattern in the third. The association in the last period between high average wages and rate of wage increase alluded to previously results from the classification of states by capital and employment growth. There is nevertheless no pattern of wage divergence in this last period.

Table 1 also supports quite strongly the view that an increase in the total income to capital relative to the amount of labor employed will yield an increase in the wage. Reading across the table, we see

[12] Hanna's data [4] show that the coefficient of variation of wage and salary income per capita declines from 1929 to 1948, and then remains roughly constant to 1951. He does not give any evidence on this coefficient in 1919, presumably because of a different source of data and slightly different definitions. Easterlin's findings [2] indicate that convergence did not occur between 1919-1921 and 1949-1951. Muth's findings [9, pp. 854-77] confirm the failure of state differences in income per worker to narrow in the period between 1920 and 1929, and again after the second world war.

[13] χ^2 is defined as $\sum_{ij} [f_{ij}-Q_{ij}]^2/Q_{ij}$ where $Q_{ij} = \sum_i f_{ij} \cdot \sum_j f_{ij} / \sum_{ij} f_{ij}$; f_{ij} is the number of observations in the ith column, jth row.

TABLE 2—CLASSIFICATION OF 48 STATES BY WAGE LEVEL AND RATE OF WAGE INCREASE, 1919–1929, 1929–1948, 1948–1953

Wage Level	Rate of Wage Increase					
	1919–1929		1929–1948		1948–1953	
	Above Average	Below Average	Above Average	Below Average	Above Average	Below Average
Above Average	14	9	5	21	11	9
Below Average	6	19	20	2	15	13
Value of χ^2	6.71		24.52		.01	

that without an exception in each time interval an increase in capital growth relative to employment growth is accompanied by a greater increase in the wage. This conclusion is also supported by evidence on correlation between the change in the total return to capital, the change in employment, and the change in wages. Let us measure the change in the ratio of capital to labor as the difference between the percentage change in capital and the percentage change in labor.[14] Denote this variable as x, and denote the percentage change in wages per employee as y. Then, we have the following correlation coefficients for each time interval:

1919-1929 $r_{xy} = +.508$
1929-1948 $r_{xy} = +.727$
1948-1953 $r_{xy} = +.236$

The first two coefficients are significant in the probability sense at the 5 per cent level, the third is not. However, for the 1948-1953 period, the partial correlation between the change in capital and the change in wages, holding the change in employment constant, is much larger, yielding a significant coefficient of $+.688$.[15] The partial correlation results do indicate that wages respond to increases of capital. However, the observed relation for the 1948-1953 period cannot be stated in terms of the ratio of capital to labor.

B. *The Influence of Agriculture*

It is conceivable but unlikely that the widespread decline in agricultural income in the 1919-1929 and 1948-1953 intervals is responsible

[14] For incremental changes, $\frac{\Delta(C/L)}{C/L} = \frac{\Delta C}{C} - \frac{\Delta L}{L}$.

[15] The discrepancy between the two coefficients occurs because of the nature of the simple correlations between the variates. The correlation of two ratios, X/Z and Y/Z will yield the same results as the partial of X on Y, given Z, when the regressions of X on Z and Y on Z are homogeneous. This condition is not fulfilled in the 1948-1953 period. For a proof of the proposition, see Meyer and Kuh [8, App. C].

for the absence of wage equalization in those periods. An examination of the data indicates that it would be a mistake to attribute the different behavior of wages and capital in the three periods to the varying fortunes of agriculture.

The states which suffered declines in agricultural income were in fact largely low-wage states. It is reasonable to expect that the demand for nonagricultural services would also suffer in these states; hence, low-wage states would experience a low rate of increase of nonagricultural wages as a consequence of the depression in the agricultural sector. To carry the argument further, the low-wage states would experience the strongest wage increase in the 1929-1948 period as a consequence of the sharp expansion of agricultural income at that time.

The explanation requires that the wage convergence of 1929-1948, and the wage divergence of the other two periods, be observable mainly in the agricultural states. It is contradicted by the data. The behavior of wages in the agricultural states frequently departs from this historical pattern. Therefore we can reject the presumption that the wage behavior in all states in the three periods is due to the influence of national agricultural patterns acting on the states most heavily dependent on this industry.[18]

C. *The Interaction between Increase in Wages and Reallocation*

In Section I, it was argued that an increase in the relative price of output in labor-intensive industries would raise the real wage. This proposition is demonstrated graphically in the Appendix. It is there also shown that the elimination of excessive employment in labor-intensive industries might raise the real wage in states with a high proportion of such industries. The possible existence of these two influences has been investigated for the 1929-1948 period. This period was chosen out of the three because it was long enough to permit the adjustments which the analysis presumes. Further, it encompasses the strongest equalization movement of the three periods. The data indicate that it is the one period out of the three in which the sharpest reallocation of employment occurred between the labor-intensive and capital-intensive sectors of each state. Any effect which the elimination of misallocation might have on the real wage should show up in this period.

If these two influences are to be detected, they will show up as a

[18] These conclusions are based upon an examination of the behavior of wage levels and wage growth in agricultural and nonagricultural states. The states in Table 1 were classified by the importance of agriculture. It was observed that the wage behavior observed in the three periods held as well for the states least dependent upon agriculture.

change in wages over and above that already explained by the change in the return to capital relative to the number employed.[17]

It is not possible to measure directly the change in relative prices of the labor-intensive and capital-intensive sectors of each state. An approximation is made on the basis of empirical specification of the content of the two sectors.[18] I shall approximate the relative increase of prices in each state sector by the difference between the relative increase in wage earnings per employee in the two sectors. This measure is useful only when wages in the two sectors are initially and finally unequal. If they were always equal, the index would have a value of zero. Because wage equality does not exist initially or finally, the index should provide a useful measure of the extent to which the prices of the products of the labor-intensive sector have risen relative to the prices of the products of the capital-intensive sector.[19]

The actual measure employed is the percentage rise of service wages less the percentage rise of manufacturing wages. This measure will be

[17] The wage per worker in one sector of a region's economy may be written as:

$$W = f_L \cdot P_x$$

where f_L is the marginal physical product of labor, and P_X the price of output. Similarly, the money return per unit of capital may be written as:

$$R = f_C \cdot P_x$$

where f_C is the marginal physical product of capital. f_L and f_C are functions of C/L the ratio of physical capital to labor. Ignoring second-order terms,

$$dW = f_L \cdot dP_x + P_x f'_L d\left(\frac{C}{L}\right)$$

$$\frac{dW}{W} = \frac{dP_x}{P_x} + \frac{f'_L}{f_L} d\left(\frac{C}{L}\right)$$

and

$$dR = f_C \cdot dP_x + P_x f'_C d\left(\frac{C}{L}\right)$$

$$\frac{dR}{R} = \frac{dP_x}{P_x} + \frac{f'_C}{f_C} d\left(\frac{C}{L}\right)$$

Substituting, we have

$$\frac{dW}{W} = \frac{dR}{R} + \left(\frac{f'_L}{f_L} - \frac{f'_C}{f_C}\right) d\left(\frac{C}{L}\right)$$

The wage per worker will rise: (a) if there is a rise in the money return per unit of capital, (b) if there is a rise in the proportion of physical capital per worker, (c) if there is a rise in the marginal product of labor and therefore a fall in the marginal product of capital. The effects of (a) and (b) on dW/W have been taken into account by correlating the change in wages with the change in the return to capital relative to the number of workers. The effect of (c) is to be taken into account by determining the extent to which unexplained changes in dW/W are related to changes in the relative price of labor- and capital-intensive sectors.

[18] The two sectors are defined in footnote 7.

[19] The use of this measure requires that technological change either be absent or have little effect on the ratio of prices to wages in each sector.

used to classify the residuals from the regression of wage growth on the growth of the capital-labor ratio. The relation is summarized in Table 3. There is a strong significant association between the residuals from the regression and the relative increase of wages in the two sectors.[20] In those states where average wages grew by a greater percentage than predicted by capital accumulation the service wage grew far more rapidly than the manufacturing wage.

TABLE 3—CLASSIFICATION OF RESIDUALS FROM REGRESSION BETWEEN WAGE INCREASE AND INCREASE IN THE CAPITAL-LABOR RATIO, 48 STATES, 1929–1948

Increase in Wages in Services Sector less Increase in Wages in Manufacturing Sector	Wage Increase Greater than Predicted by Regression	Wage Increase less than Predicted by Regression
	States	States
Greater than Average	15	9
Less than Average	5	19

The interpretation of this relation must be clarified. It may exist because of the elimination of wage differentials in the two sectors or because of the alteration of service prices relative to manufacturing prices.[21] The index of wage changes may be written as follows:

$$\frac{\Delta W_s}{W_s} - \frac{\Delta W_m}{W_m} = \frac{W_s^1 - W_s^0}{W_s^0} - \frac{W_m^1 - W_m^0}{W_m^0}$$

where W_s denotes service wages, W_m denotes manufacturing wages; the superscript 1 denotes the later time period, the superscript 0 denotes the initial time period. If we assume that wages in the two sectors are equalized in the final period, the index becomes:

$$\frac{W_s^1 - W_s^0}{W_s^0} - \frac{W_s^1 - W_m^0}{W_m^0} = \frac{W_s^1 (W_m^0 - W_s^0)}{W_s^0 W_m^0}.$$

The index then depends upon the initial discrepancy between wages in the two sectors and the final level of wages. This form of the index was computed to determine its relation to the regression residuals. In

[20] A significance test on the contingency table yields a value of $\chi^2 = 8.58$ which is significant at the 1 per cent level. A test on the average value of the residuals from the regression yields a significant value of $F = 7.758$, with 13 per cent of the variance of the growth of wages explained by this classification.

[21] The elimination of sectoral differentials would yield an increase in the average wage if the sector with growing wages strongly outweighed in importance the other sector.

a sense this provides a test of the hypothesis that the observed association is explainable in terms of the equalization of wages which took place in the two sectors. For it removes from the index any influence of sectoral wage differences in the final period. The index was computed for each state in the form shown above. When the index is compared with the residuals from the regression, the contingency table which results is not significant. That is, classification by the index in the above form does not classify the regression residuals in a significant fashion.[22] The index was also computed under the assumption that wage equality results among states as well as within states That is, the index computed was

$$\frac{W_m^0 - W_s^0}{W_m^0 \cdot W_s^0}.$$

Again, there is no relation between this classification and the residuals from the regression.[23]

From this we conclude that elimination of the initial discrepancy in wages between sectors in each state does not by itself explain any of the wage increase in the period. The residual wage increase is, however, explained by the increase of service wages relative to manufacturing wages. This indicates that those states which enjoyed the greatest increase of service prices relative to manufacturing prices appear to have undergone a reallocation of resources yielding an increase in the capital-labor ratio, and an increase in the marginal product of labor.

The results of these tests indicate that the second model plays a powerful role in explaining the increase of wages and capital among

[22] The resulting contingency table is the following:

Increase in Service Wages less Increase in Manufacturing Wages	Wage Increase Greater than Predicted	Wage Increase Less than Predicted
Greater than average	10	14
Less than average	10	14

[23] The resulting contingency table is:

Increase in Service Wages less Increase in Manufacturing Wages	Wage Increase Greater than Predicted	Wage Increase Less than Predicted
Greater than average	10	14
Less than average	10	14

states. In the next section, certain aspects of this model are examined in greater detail.

D. *The Convergence of Wages*

We have seen that nonagricultural wage differences failed to narrow in two of the three time intervals examined. They diverged considerably from 1919 to 1929; and only in the 1929-1948 period was there a continuation of the convergence pattern which investigators found prior to 1920. It is useful to inquire why these different patterns occurred, and what light they shed on the possibility for future narrowing of wage differences. Possible answers can be phrased in terms of the general framework presented at the beginning of this paper.

1. The failure of wages to converge is rather surprising in view of the available evidence that these periods witnessed considerable interstate migration from low- to high-wage states.[24]

While migration was going on in the right direction it is conceivable that varying rates of migration might be responsible for the failure of wages to converge. If interstate migration from low- to high-wage areas slowed down, then the rate of wage convergence might stop. Further, if the rate of migration failed to empty an area as fast as the birth rate was filling it, the pressure of labor supply on wages in a low-wage area might prevent convergence. What evidence exists seems to contradict this explanation.[25] However, even if the migration data sup-

[24] Migration data have been collected on a uniform basis in [6]. The states have been classified by their average wage and by the degree of in-migration or out-migration (measured in migrants as a per cent of population). The results for the two time-intervals for which migration data are available are shown below. They indicate a strong positive association between migration and wage level. That is, low-wage states experienced greater out-migration, and high-wage states experienced in-migration.

	High-Wage States		Low-Wage States	
	1919–29	1929–48	1919–29	1929–48
States showing net in-migration:				
1920–1930	14	—	2	—
1930–1950	—	15	—	5
States showing net out-migration:				
1920–1930	9	—	23	—
1930–1950	—	11	—	17

In both time intervals, the strong association is due primarily to the high out-migration from low-wage areas. The degree of association is stronger in the earlier period.

[25] We have already seen in the previous footnote that the relation between migration and wages is stronger in the 1919-1929 period, when wages diverged. In this period, there is also a strong association between wage increase and population growth. That is, migration

ported this explanation, it would still not deal with the evidence on capital accumulation. Capital was growing more rapidly in high-wage states in two of the three periods examined. Migration in response to wage differentials cannot explain this movement of capital.

Migration might be used to explain capital formation through the influence of new in-migrants on capital requirements. It might be argued that when a large population influx hits an urban area, there is a demand for capital to provide housing and public and private services. This was suggested earlier as one of the causes of growth of high-wage areas. Both the 1919-1929 and 1948-1953 intervals follow periods in which there was strong migration from low- to high-wage states. Prior to each of these periods there were restrictions on the volume of urban construction due to wartime use of materials and of capital funds. It is possible that the higher growth of capital in high-wage areas in these two periods represents a catching up in the stock of urban capital required by prior increases of population. The same capital formation pattern would not be observed in the 1929-1948 period due to the depression and then the war.

The evidence on migration and on population growth does not give uniform support to this explanation. In Table 4, for 1919-1929 and for 1948-1953, the states are classified by capital growth and employment increase. For each case the average rate of population growth and rate of migration for the period prior to the one examined is shown. If the above explanation be valid, then states with higher rates of capital formation should have had higher rates of in-migration (shown as positive) and higher rates of population growth in the prior period.

The implication of the hypothesis with regard to population growth is contradicted by the data. In 3 out of 4 cases, holding employment increase constant, the states with higher capital growth had smaller rates of population growth. The data on migration agree with the hypothesis in three out of four cases, showing higher in-migration or lower

was strong enough to slow the rate of population growth of low-wage regions. This is seen in the following table which classifies the 48 states by the wage level in 1919 and the rate of population growth between 1919 and 1929.

	Above Average Wages	Below Average Wages
Above average population growth 1919–1929	14	4
Below average population growth	9	21

Thus in the period 1919-1929, migration was sufficient to produce an emptying of low-wage areas and yet insufficient to produce wage equalization.

TABLE 4—AVERAGE RATE OF POPULATION GROWTH AND AVERAGE RATE OF IN-MIGRATION (+) IN 48 STATES, CLASSIFIED BY EMPLOYMENT GROWTH AND BY CAPITAL GROWTH, 1919–1929, 1948–1953

	1919–1929		
		High Capital Growth	Low Capital Growth
High Employment Increase	1. Average Rate of Population Growth 1910–1920	17.84%	18.64%
	2. Average Rate of Migration Per Capita 1910–1920	+.019	+.002
Low Employment Increase	1. Average Rate of Population Growth 1910–1920	10.60%	15.63%
	2. Average Rate of Migration Per Capita 1910–1920	−.010	+.013
	1948–1953		
		High Capital Growth	Low Capital Growth
High Employment Increase	1. Average Rate of Population Growth 1930–1950	38.86%	12.05%
	2. Average Rate of Migration Per Capita 1930–1950	+.107	−.205
Low Employment Increase	1. Average Rate of Population Growth 1930–1950	14.54%	19.66%
	2. Average Rate of Migration Per Capita 1930–1950	−.067	−.070

out-migration in states with higher rates of capital formation. However in one case, the agreement is by the very small margin of three migrants per 1000 of state population. In the cases where agreement is strong, the difference is as large as 310 migrants per 1000 of state population. The hypothesis receives its strongest support in the 1948-1953 period. It receives no confirmation in the 1919-1929 period. For these reasons I would not attribute a great deal of importance to the role of migration as a general explanation of differences in capital formation.

2. There is a second possible explanation of the failure of wages to converge in two periods. If the marginal efficiency of investment was influenced primarily by the demand for commodities produced by the export sector of each region, there might be an export boom in high-wage states. This explanation requires that in the 1919-1929 and 1948-1953 periods demand for the products of high-wage industries

increased relative to the demand for the products of low-wage industries. In the 1929-1948 period the reverse would have to occur.

Investigators have discovered a high correlation between the industrial composition of a state and the average wage level.[26] A state with a large proportion of nationally high-wage industries tends to have a higher average wage than a state with a large proportion of nationally low-wage industries. Therefore, a relative increase nationally in the demand for the products of high-wage industries would primarily affect the states containing such industries.

The influence of demand conditions can be perceived partly through the changes of prices. If demand for a certain class of goods rises more than for another class, we can expect the prices of the former class to rise by a greater proportion, other things being equal. The factors remaining equal would be technology and the other influences on the elasticity of supply. We would also expect the output of this sector to rise more rapidly than in other sectors. Using this as a background, we can inquire how the high-wage and low-wage industries of the country behaved in these periods.

Is there evidence that from 1929 to 1948 demand for the products of low-wage industries rose more rapidly than demand for products of high-wage industries? The price data do not support such an expectation. The wholesale prices of 34 manufactured products were examined between 1929 and 1948. The wage levels and wage increases in the industries producing these commodities were also examined.[27] There is no indication that products of low-wage industries rose more in price than products of high-wage industries. At the same time it appears that the wage increases in high-wage industries were on the average less than that in low-wage industries. This is the convergence pattern among industrial wages alluded to previously.[28] This indicates that there was a difference in the elasticity of labor supply facing the two sectors. Labor shifted from low- to high-wage sectors, especially after 1939 with the appearance of war-induced employment opportunities. This would increase the likelihood that a greater increase in demand for low-wage products would yield greater price increases than

[26] See Muth [9, pp. 878-939], Hanna [4], and Perloff [12].

[27] The rank correlation among industries between the wage level in 1929 and relative price increase from 1929 to 1948 is not significantly different from zero. Price data for 1919, 1929, 1948, and 1953 were taken from [24] [25] [26] [27] [28]. Also, data for 1953 were taken from [29]. Data on wages and wage increases by industry for 1919, 1929, 1948 and 1953 were taken from the relevant Censuses of Manufactures for the years 1919, 1929, and 1947 [18] [20] [21]; data for 1948 and 1953 were taken from [30].

[28] The Spearman rank correlation among 34 commodities between the 1929 wage level and the 1929-1948 percentage wage increase is —.36, which is significant in the probability sense at the 5 per cent level.

in high-wage products. Nevertheless, the data gave no support to such an expectation. There is no indication that the demand for low-wage products grew more rapidly than that for high-wage products from 1929 to 1948.

What of the other two periods? Here the evidence is mixed. There is clear support for the demand thesis in the 1948-1953 period. In this period there is a strong positive correlation between the initial wage level and the subsequent growth of prices. There is also a strong positive correlation between the initial wage level and the subsequent increase in wages. In this period, the high-wage industries experienced greater wage growth and greater relative price increase than the low-wage industries.[29] Thus, the regional growth patterns appear to be dominated by national demand conditions in the 1948-1953 period.

For the 1919-1929 period there is no evidence that demand conditions had a differential effect on wholesale prices or wages. In view of the divergence of wages among states in this period we should expect to find prices and wages in high-wage sectors growing more rapidly than in low-wage sectors. Actually, we find no pattern at all. There is no relation between the level of wages paid in 1919 and the subsequent growth in prices. Further, there is no relation between the initial level of wages and the subsequent increase in wages. Finally, there is no relation between wage increases and price increases. Despite this lack of confirmation from wage and price data, there are two kinds of evidence which support the demand thesis:

(a) It is clear that the physical output of high-wage sectors grew by a greater proportion than the physical output of low-wage sectors. Output indexes and wage data for 59 manufacturing industry groups were examined. A significant positive association was found between the growth of output and the level of wages.[30]

[29] The rank correlation among 34 industries between the wage level and relative price growth is +.49. The rank correlation between the wage level and relative wage growth is +.71. Both are significant at the 5 per cent level.

[30] The following table classifies the 59 industry groups by percentage growth of physical output and wage level. The resulting value of χ^2 is 12.37, which is significant at the 1 per cent level.

Growth of Output	Wage Level 1919	
	Above Median	Below Median
Above median	21	8
Below median	8	22

Manufacturing output indexes are taken from S. Fabricant [2a].

(b) Innovations among the high-wage manufacturing industries appear to have been labor-saving relative to innovations among the low-wage manufacturing industries. This would explain why increases in the demand for high-wage products had not yielded corresponding increases in prices or in wages of this sector.[31]

These two pieces of evidence indicate that demand for high-wage products grew more than demand for low-wage products from 1919 to 1929. While this did not generate a differential pattern of wage or price increases among industries, it apparently affected capital accumulation in the states containing such industries. It also affected wages in the other industries of these states.

3. A third possible explanation is that the marginal efficiency of investment was influenced primarily by wage differentials in the 1929-1948 period, but not in the other two periods. A strong case can be made

[31] The degree to which an industry has experienced a labor-saving innovation is measured by the change in the ratio of wage payments to value added. The logic underlying this measure can be seen by assuming the production function in an industry to be homogeneous of the first degree in the inputs of labor and capital, and that labor is paid the value of its marginal product. Then, the marginal physical product of labor (MP) and the average product of labor (AP) are both decreasing functions of the ratio of labor to capital (L/C). A decrease in the ratio $\frac{MP}{AP}$ will occur if L/C increases or if there has been an innovation such that at the new equilibrium $\frac{MP}{AP}$ is lower than before. In view of the fact that this was a period of rapid capital accumulation, and that wages in these industries did not fall relative to wages in other industries, it seems unlikely that L/C increased. Therefore, it seems reasonable to attribute declines in $\frac{MP}{AP}$ to the emergence of labor-saving inventions. The ratio $\frac{MP}{AP}$ is measured by the ratio of the wage bill to value added, which is, essentially, $\frac{MP \cdot P_s}{AP \cdot P_s}$, where P_s is the price of output. It should be noted that the ratio of wages to value added might fall if there was an increase in the monopoly power of an industry, since the wage would be not $P_s \cdot MP_L$, *but* $P_s(1 + 1/\eta)\ MP_L$, where η is the elasticity of demand. However, this would have shown up as a price increase in certain industries; and since it fails to show up, I have excluded it as a possible explanation. The relation between the wage level in an industry in 1919, and the change in the ratio of the wage bill to value added from 1919 to 1929 is shown below:

Ratio of Wage Bill to Value Added	High Wages Industries	Low Wages Industries	
Rose	1	10	$\chi^2 = 9.22$, significant at the 1 per cent level.
Fell	21	13	

Data are from [18] [20].

for the influence of demand in the other two periods, and I have cited the data which support this view.

The one group of products where wage differentials could be expected to have the greatest influence is manufacturing. In this sector one is most likely to find exportable commodities which are neither materials nor market-oriented. In the mining and agricultural sectors, production-function differences are likely to dominate any influence of wage differentials. In the service, transportation, and construction sectors, the growth characteristics of the market are likely to dominate the influence of wage differentials. An examination of the growth of manufacturing employment in the period 1929-48 supports the presumption that low wages were an influence on the marginal efficiency of investment. Table 5 shows the average growth of manufacturing employment in the

TABLE 5—AVERAGE RATE OF INCREASE OF MANUFACTURING EMPLOYMENT IN 48 STATES, CLASSIFIED BY NONAGRICULTURAL WAGE LEVEL, GROWTH OF NONAGRICULTURAL CAPITAL AND INCREASE IN NONAGRICULTURAL EMPLOYMENT, 1929–1948*

	1929–1948			
	High Growth of Capital		Low Growth of Capital	
	A	B	A	B
High Increase in Nonagricultural Employment	n 5 X 15.98%	11 48.29%	n 8 X 47.66%	0 —
	A	B	A	B
Low Increase in Nonagricultural Employment	n 2 X 16.07%	6 34.98%	n 10 X 26.14%	6 38.27%

* n: number of states. X: average percentage increase of manufacturing employment. A: nonagricultural wages above the national average. B: nonagricultural wages below the national average.

48 states, classified in the same fashion as above, i.e., by the growth of total nonagricultural capital, and by the increase in nonagricultural employment. In addition, the states are classified within each box by the average nonagricultural wage. The states with wages below the national average are shown under B, those with wages above the national average are shown under A. X is the average growth of manufacturing employment of the states in the subclassification.

It can be seen that within the three boxes which permit comparison, the high-wage states showed less increase in manufacturing employment than the low-wage states. This indicates that low wages are an influence on the demand for labor; or more specifically, on the marginal efficiency of investment in manufacturing.

This relation is either much weaker or nonexistent in the other two

periods. Thus, there is confirmation that the influence of wage differentials on the marginal efficiency of investment was much stronger in 1929-48 than in the other periods. Table 6 shows the same classification of states for the 1919-1929 and 1948-1953 periods. In the 1919-1929 period the influence of wage differentials is much weaker than in 1929-1948 in three cases, and is opposite to what is expected in one case. In the 1948-1953 period, comparison is possible in only three boxes. In

TABLE 6—AVERAGE RATE OF INCREASE OF MANUFACTURING EMPLOYMENT IN 48 STATES, CLASSIFIED BY NONAGRICULTURAL WAGE LEVEL, GROWTH OF NONAGRICULTURAL CAPITAL, AND INCREASE IN NONAGRICULTURAL EMPLOYMENT, 1919–1929 AND 1948–1953[a]

	1919–1929					
	High Capital Growth			Low Capital Growth		
		A	B		A	B
High Increase in Nonagricultural Employment	n	7	6	n	5	6
	X	0.80%	4.56%	X	8.76%	16.45%
		A	B		A	B
Low Increase in Nonagricultural Employment	n	7	4	n	4	9
	X	−12.25%	−15.88%	X	−8.10%	−1.91%
	1948–1953					
	High Capital Growth			Low Capital Growth		
		A	B		A	B
High Increase in Nonagricultural Employment	n	10	10	n	0	4
	X	26.69%	22.41%	X	—	13.87%
		A	B		A	B
Low Increase in Nonagricultural Employment	n	3	1	n	10	10
	X	7.66%	14.22%	X	5.33%	6.33%

[a] n: number of states. X: average percentage increase of manufacturing employment. A: nonagricultural wages above the national average. B: nonagricultural wages below the national average.

two of these the influence of wage differentials is again weaker than in 1929-1948; and in the third, we observe the opposite of what is expected.

III. *Conclusions*

1. The role of demand appears to have a strong influence on the relative movements of capital and on the increase in wages in the different states. This appears to be the chief reason why wage convergence failed to appear in two out of three periods; and it indicates strong support

for a model of regional growth based on the demand for a region's exports.

2. The influence of wage differentials on the marginal efficiency of investment appears only in the 1929-1948 period. Here we observe a convergence of wages among states. However, this period also witnessed an influence favorable to wage increases which is not likely to be repeated. This was the increase in the marginal product of labor arising from the relative increase in prices in the labor-intensive sectors of growing states.

3. In all periods examined, interstate migration occurs, as expected, from low- to high-wage areas. Nevertheless, migration does not appear sufficient to produce convergence. It clearly produces less divergence than would occur were migration to halt. The chief influence favorable to the increase in wages appears to be the movement of capital, and this is apparently not explainable by migration patterns.

In view of these conclusions, the prospects for wage convergence appear to depend on three elements: (a) continuation of migration from low- to high-wage areas; (b) elimination of the major driving force behind migration, namely the high population reproduction rate in low-wage areas; (c) the direction of capital formation to low-wage areas. Whether wages will continue to converge in the future depends on the relative strength of these three elements. We have observed two periods in which they interacted to prevent convergence.

Appendix

The influence of accumulation on the marginal physical product of labor may be demonstrated graphically with the aid of the familiar box diagram.[32] In Figure 1 the quantity of labor employed is measured along the vertical axis, capital along the horizontal. Inputs for sector X (labor intensive) are measured from the southwest origin, inputs for sector Y are measured from the northeast origin. The ray from each origin shows the ratio of labor to capital that would be employed at a given set of factor prices in the production of each commodity. At their intersection point α, the isoquants (not shown) are tangent to one another; and their slope at this point gives the marginal rate of substitution between L and C employed in both sectors. This slope corresponds to the relative prices of the factors. The dashed line through α is the contract curve showing other maximum values of X that could be produced for other given values of Y. It is assumed that α is the only efficient point in the box with this value of the marginal rate of substitution. Under these assumptions every point on the contract curve will be represented by a corresponding point on a convex production-possibility curve in X and Y. The combination of X and Y at α will be produced only for a unique value of P_x/P_y.[33]

[32] A complete demonstration is to be found in Rybczynski [13].

[33] See Bator [1], Worswick [16], and Green [3].

Therefore, the capital-labor ratios in X and Y will be used only for that value of P_x/P_y. If the value of P_x/P_y changes, then production will shift to some other point on the contract curve,[34] and other values of the capital-labor ratios will be employed.

Now let us increase the amount of capital by ΔC. This shifts the horizontal dimension of the box as shown. At α', where the production of Y has increased and X decreased, the capital-labor ratio is unchanged in each sector, and the marginal rate of substitution between the products X and Y is unchanged. Therefore, the value of P_x/P_y at α' is the same as at α. However, if output had shifted to α^* (on the new contract curve going through α'), the capital-

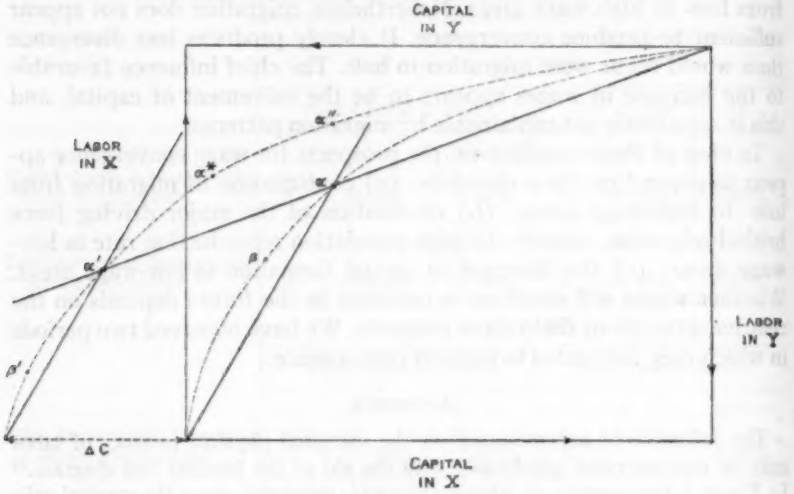

FIGURE 1

labor ratios in both industries would have risen. This would occur when the price of X had risen relative to the price of Y.

Thus, we have reached the following conclusions:

1. Accumulation will lead to an increase in the marginal physical product of labor when it is accompanied by a rise in the ratio of capital to labor in each industry sector.

2. This will occur when the price of output of the labor-intensive sector rises relative to the price of output of the capital-intensive sector.

3. This means that the output of the capital-intensive sector has failed to expand by enough to leave the ratios of input combinations unchanged.

4. If accumulation leads to an increase in the marginal physical product of labor, it will also result in a decline in the marginal physical product of capital.

[34] Points on the contract curve are consistent with long-run equilibrium in each industry. Short-run equilibrium positions which are not long-run equilibrium positions represent movements off the contract curve.

Similar conclusions would be reached if in the initial situation labor was misallocated and wage differentials existed between the X and Y industries. The elimination of the misallocation can, but does not necessarily, provide an impetus to the increase in wages over and above any produced by accumulation. For example, assume that efficient point α is consistent with the long-run equilibrium of demand and supply in industries X and Y. Further, assume that the pre-accumulation allocation was inefficient and was located at α'' in Figure 1. This would involve an excessive employment of labor in the labor-intensive sector X.[35] At point α'', the price of X relative to Y (P_x/P_y), the marginal physical product of labor in X, and the wage per worker in X all were lower than they would have been at α, while the marginal physical product of labor and the wage per worker were higher in Y than they would have been at α. If the X sector were large enough, its relatively low wage would overshadow the relatively high wage paid by the Y sector and pull down the total wages paid in the region. In this case the elimination of misallocation and a movement from α'' to α would raise the total wage payment.

That this does not necessarily happen, however, can be seen from the following: Suppose that α'' were to become an efficient point as a result of the accumulation ΔC; that is, it becomes a point on the new contract curve going through α' and α^*. Further suppose that the price ratio in effect at α'' remained unchanged due to the nature of changes in demand conditions for the two sectors accompanying the accumulation. The result would be a change in allocation between the two sectors such that the marginal physical product of labor in the two sectors is either lower or unchanged from the situation when labor was misallocated.

This result can be seen in the following way. Initial demand conditions were such that α would be the efficient point with a value of the price ratio equal to P_x'/P_y'. At α'' the price ratio in effect was lower than P_x'/P_y' because more X and less Y was produced than at α. Call the price ratio at α'' P_x''/P_y''. There is an efficient production point corresponding to P_x''/P_y'', which is to the southwest of α. Call this point β. Corresponding to β is an efficient point β' on the new contract curve with the same price ratio. If when α'' becomes efficient, the price ratio remains at P_x''/P_y'', allocation will move to β'. At β', the ratio of capital to labor in Y is lower than at α'', while the ratio in X is not perceptibly changed from what it was when α'' was inefficient. At β', the money wage in X is equal to that in Y. This has been accomplished through a fall of the wage in Y.

We see that the movement from α'' to β' is a depressant on the marginal physical product of labor outweighing the elimination of the misallocation. Thus, the elimination of misallocation will not necessarily raise wages in a region when accompanied by accumulation. This depends on the final production point.

Note that if P_x/P_y had risen above P_x''/P_y'', there could have been an increase in wages. For example, if P_x/P_y had risen sufficiently, allocation could

[35] Such a description appears to be a reasonable explanation of the wide discrepancy in earnings between the services sector and the manufacturing sector to be found in many low-income states prior to the second world war.

have remained at α'' after it became efficient. All of the additional capital (ΔC) would then have been used in X to raise the marginal physical product of labor in that sector up to a level where the money wage in X again equaled that in Y.

Thus, the conclusions are the same as before: In order for the marginal physical product of labor to rise as a consequence of accumulation, there must be an increase in the relative price of labor-intensive goods.

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MONETARY RESERVES AND CREDIT CONTROL

By JAMES M. HENDERSON*

Federal Reserve policy ". . . operates largely by regulating the volume of member-bank reserves, which constitute the base for bank credit and the money supply" [8, p. 10]. The Federal Reserve authorities have encountered a number of difficulties, but, on the whole, have been able to limit the rate of growth of member-bank reserves, and to a lesser extent member-bank credit. Member-bank credit, however, is only one of many types of credit. The Federal Reserve has little control over credit which is not based upon the issuance of new money. Nonmonetary credit has increased at a rapid rate since the accord.

The recent growth of credit extended by financial institutions other than commercial banks appears to be an intensification of a long-term trend. Goldsmith's pioneering study shows a relative decline of commercial-bank credit between 1900 and 1949 [3]. Gurley and Shaw have considered some of the theoretical and policy implications of the rapid growth of "financial intermediaries" in a path-breaking analysis, and have suggested a "financial control" over the assets created by these institutions [4]. The nature of such control, however, is not indicated other than by a suggestion that the assets held by particular types of institutions might be directly regulated. There does not appear to be any unified control system which could serve to regulate such diverse institutions as savings and loan associations and private pension funds, both of which are included within the general category of "financial intermediaries."

The proposal presented here is far from global. It is limited to an extension of legal reserve requirements and Federal Reserve control to those institutions issuing liabilities that may be classified as savings deposits. The credit extended by such institutions represents a substantial proportion of the volume of institutional credit outside of Federal Reserve control and has been growing at a very rapid rate. In fact, credit based upon savings deposits now exceeds credit based upon demand deposits. Savings and demand deposits are close asset substitutes, and a lack of control or an inadequate control over the institutions issuing savings deposits has raised serious problems regarding both the effectiveness and the equity of Federal Reserve policy.

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The following two sections contain a general discussion of the nature of credit and the means of its control. The effect of monetary reserves is the principal subject of Section I. Section II is devoted to a discussion of the relation between asset choice and the volume of credit. Experience since the Treasury-Federal Reserve accord of March 1951 is examined in the light of this discussion in Section III. The proposal for savings-bank regulation is presented in Section IV, and some of its consequences and problems in Section V.

I. *Monetary Reserves*

Liabilities, Assets, and Credit. Credit extension is a transaction in which a borrower exchanges a financial liability—i.e., a promise to pay a specified number of dollars—for goods or money. Outstanding credit is most broadly defined as the money value of all outstanding financial liabilities, or equivalently, the money value of all financial assets. But since our primary concern is the spending on goods and services generated by credit extension, a more restrictive definition is used. Outstanding credit is defined as the money value of the financial liabilities of final spenders, i.e., households, nonfinancial business enterprises, and governments, which we shall collectively call *the public*. This definition excludes money and the other liabilities of financial institutions, but includes the liabilities of the public which are held as assets by financial institutions.

The public contains creditors as well as debtors. As a result, many credit transactions take place between different members of the public with the liabilities of one member becoming the assets of another. Examples of such transactions are provided by the purchase of a new corporate bond by an individual, the shipment of goods on credit from a wholesaler to a retailer, and the purchase of new government securities by a business firm. Credit also flows to the public from financial institutions in exchange for bank loans, mortgages, securities, and other liabilities. The Gurley-Shaw term *direct debt* is used to denote public liabilities which are held as assets by the public. Total credit is the sum of direct debt and institutional credit.

The financial institutions occupy an intermediate position in the credit process. They issue financial liabilities and use the purchasing power thus obtained to acquire the financial liabilities of others, which they hold as assets. Demand deposits are unique among the private institutional liabilities in that they serve as a widely accepted means of payment; i.e., they are money. Savings deposits are fixed in money value and possess other properties in common with demand deposits, but do not serve as a means of payment and therefore are not money. Because of this basic difference between demand and savings deposits,

a commercial bank which issues both is treated as two separate institutions.

Federal Funds Absorption. Monies issued by the federal government are designated by the term *federal funds*. These include deposits at the Federal Reserve Banks as well as currency issued by the Federal Reserve Banks and the Treasury.[1] The publicly held money supply depends upon the quantity and distribution of federal funds. Currency is money, and the quantity of commercial-bank demand deposits is linked to the commercial banks' holdings of Federal Reserve deposits.

The commercial banks must freely exchange demand deposits for currency in order to maintain the former's money quality. The banks play a passive role in this respect. The public and the other financial institutions determine the distribution of their money holdings between currency and demand deposits, and the surplus or deficiency of currency flows to or from the commercial banks. As a result of maintaining demand deposits as money, the commercial banks are the residual holders of the outstanding supply of federal funds.

Member banks hold federal funds in the form of both currency and Federal Reserve Bank deposits. For simplification it is assumed that their legal reserve requirements refer to their total funds holdings without distinction between the two types. It is also assumed that there is a single legal reserve ratio for all member banks of α_m dollars of federal funds for each dollar of demand deposits subject to the requirement.

Commercial banks also hold *domestic balance reserves* in the form of each other's demand deposits in order to facilitate their operations, and to a lesser extent, to provide an additional reserve against withdrawals. Assume that each holds β_m dollars of domestic balances as assets against each dollar of its demand-deposit liabilities which are subject to the reserve requirement. The interbank deposit liabilities of correspondent banks are subject to the reserve requirement. The banks that hold domestic balances as assets, however, are allowed to deduct the amounts of these balances from their total demand-deposit liabilities before computing reserve requirements.

The *federal-funds absorption ratio* for a financial liability is defined as the amount of federal funds which directly and indirectly support a one-dollar public holding of the liability. The ratio for a member-bank demand deposit equals α_m. The bank which issues the deposit to the public holds $(1 - \beta_m)\alpha_m$ dollars of federal funds, and correspondent banks hold the remaining $\beta_m\alpha_m$ dollars.[2]

[1] Some definitions of federal funds used elsewhere include only Federal Reserve Bank deposits.

[2] The first correspondent bank issues a new interbank deposit liability for β_m dollars, in-

Savings banks receive currency and demand deposits from the public in exchange for their nonmonetary liabilities, extract customary monetary reserves, and exchange the remaining money for the liabilities of borrowing members of the public. As a result of the redemption passivity of the commercial banks on demand-deposit account, the savings banks are able to apportion their reserves between federal funds and domestic balances in any manner they choose without affecting the outstanding value of *their* liabilities.

Assume that a savings bank holds reserves of α_s dollars of federal funds and β_s dollars of domestic balances in a member bank against each dollar of its savings-deposit liabilities. Its federal-funds absorption ratio is the sum of the federal-funds reserves that it holds and those that are tied up in the member banks to support its domestic-balance reserves:

$$r_s = \alpha_s + \beta_s r_m \tag{1}$$

where $r_m = \alpha_m$ is the member-bank absorption ratio. Equation (1) can be used for the computation of absorption ratios for all types of savings banks and any other financial institution which holds monetary reserves.

Differential Reserve Holdings. Average reserve ratios and the implied federal-funds absorption ratios for the end of 1957 are listed in Table 1. Member and nonmember commercial banks are listed separately. Demand and savings deposit activities are also separated for each group of commercial banks.[3] The absorption ratios for nonmember banks were computed from equation (1) on the assumption that their domestic balances were held at member banks.

Since monetary reserves bear zero rates of return, the monetary reserve ratios—the sums of the federal-funds and domestic-balance ratios—provide an indication of the relative sacrifice respectively made

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creases its domestic-balance reserve by β_m^2, and its federal-funds reserve by $(1 - \beta_m)\alpha_m\beta_m$. The correspondent of this bank in turn increases its domestic-balance and federal-funds reserves by β_m^3 and $(1 - \beta_m)\alpha_m\beta_m^2$, respectively. The federal funds supporting the successive domestic-balance reserves form the geometric progression:

$$(1 - \beta_m)\alpha_m\beta_m, \quad (1 - \beta_m)\alpha_m\beta_m, \quad (1 - \beta_m)\alpha_m\beta_m, \cdots$$

which has the limiting sum $\alpha_m\beta_m$.

[3] The distribution of reserve holdings between the two commercial-bank activities must necessarily be arbitrary in some respects. The Federal Reserve Bank deposits of member banks were distributed by assigning required reserves to savings deposits, and allocating the remainder, including all excess reserves, to demand deposits. Vault cash and domestic balances of both member and nonmember banks were distributed on the assumption that the amounts held against each dollar of demand deposits were three times as great as the amounts held against each dollar of savings deposits.

in supporting the various deposits.[4] The monetary reserve ratios for member banks are somewhat higher than those for nonmember banks. The major difference between the monetary reserves of the two types of banks, however, is in form not size. Member-bank reserves are mainly in the form of federal funds; nonmember reserves are mainly in the form of domestic balances. As a result, the nonmember banks have much lower absorption ratios. A nonmember demand deposit absorbs less than half the amount of federal funds absorbed by a member-bank demand deposit. The savings banks other than member banks also hold most of their reserves in the form of domestic balances, and consequently their absorption ratios are low relative to their monetary reserve ratios.

TABLE 1—AVERAGE RESERVE RATIOS: DECEMBER 31, 1957

Type of Liability and Institution	Monetary Reserve Ratios			Absorption Ratio
	Federal Funds	Domestic Balances	Total	
Demand deposits:				
Member banks	.183	.064	.247	.183
Nonmember banks	.035	.199	.234	.071
Savings deposits:				
Member banks	.058	.026	.084	.063
Nonmember banks	.012	.066	.078	.024
Mutual savings banks	.004	.018	.022	.007
Savings and loan associations	.010	.041	.051	.018

Sources: Federal Reserve Bulletin; [9] [10].

Monetary reserve ratios for savings deposits are much lower than those for demand deposits. This differential rests on the assumption that savings deposits are less subject to sudden withdrawals and therefore require a smaller safety margin. Although this assumption may be true, it ignores the role of reserves in the process of credit control. Since Federal Reserve authorities regulate credit by regulating the amount of federal funds outstanding, the absorption ratios are the significant figures for credit policy. Since these are not uniform for all assets, the volume of credit which can be supported by a given amount of federal funds depends upon the public's distribution of its asset holdings.

II. *Asset Choice and Credit Control*

Asset Exchanges. Financial, as well as commodity, transactions generally take place through the media of demand deposits and currency,

[4] The banks bear an additional earnings sacrifice in so far as they hold low interest-yielding government securities as nonmonetary secondary reserves.

with demand deposits being far the more important. Since demand deposits are the dominant medium of exchange and the commercial banks are the residual holders of federal funds, all public financial transactions can be treated as one or more exchanges between demand deposits and other financial assets. If an individual uses currency to increase his savings deposits, he is assumed to exchange currency for a demand deposit and then exchange the demand deposit for a savings deposit. If he decreases his savings deposits to obtain a direct-debt asset, he is assumed to exchange a savings deposit for a demand deposit and the demand deposit for a direct-debt asset. Once the effects of exchanges between demand deposits and the other financial assets have been determined, the effects of all other asset exchanges can be computed as sums of these.

As a first step, consider the changes in aggregate credit and publicly held demand deposits which would occur if a member of the public exchanged a one-dollar member-bank demand deposit for a savings deposit. It is initially assumed that the aggregate of federal funds remains unchanged, and that the member banks are always "fully loaned-up," i.e., create the maximum amount of demand deposits allowed by their holdings of federal funds. The resultant changes in the balance sheets of the member banks as a whole and the savings bank under investigation are outlined in Table 2. The asset and liability changes are considered in a three-stage sequence for expositional convenience. Each entry consists of an amount and a capital letter denoting the sector on whose balance sheet an offsetting entry is made. P, S, M, and F respectively denote the public, the savings bank, the member banks, and the Federal Reserve Banks.

The initial exchange of deposits is described in the first stage. The member banks merely transfer an existing deposit from an individual account to the savings bank's account. The savings bank records its newly acquired demand deposit as an asset and increases its deposit liabilities by an equal amount. The savings bank's disposition of the demand deposit is recorded in Stage 2. It draws α_s dollars worth of federal funds from the member banks and retains β_s dollars as a domestic balance in order to maintain its customary reserves. The remaining $(1 - \alpha_s - \beta_s)$ dollars are exchanged for the liabilities of public borrowers.

The contraction of member-bank deposits and credit which results from their loss of federal funds is described in Stage 3. Since each dollar of federal funds supports $1/\alpha_m$ dollars of member-bank demand deposits held outside of the system, a loss of α_s requires a deposit contraction of α_s/α_m dollars. The federal funds withdrawal by the savings bank reduces demand deposits by α_s dollars. The remaining $(\alpha_s/\alpha_m - \alpha_s)$

TABLE 2—BALANCE SHEET EFFECTS OF EXCHANGING A ONE-DOLLAR DEMAND DEPOSIT FOR A SAVINGS DEPOSIT

Stage	Member Banks		Savings Bank	
	Assets	Liabilities	Assets	Liabilities
1		P − 1 S + 1	M + 1	P + 1
2	F − α_s	S − (1 − β_s) P + (1 − α_s − β_s)	M − (1 − β_s) F + α_s P + (1 − α_s − β_s)	
3	P − $\left(\frac{\alpha_s}{\alpha_m} - \alpha_s\right)$ M − $\beta_m \frac{\alpha_s}{\alpha_m}$	P − $\left(\frac{\alpha_s}{\alpha_m} - \alpha_s\right)$ P − $\beta_m \frac{\alpha_s}{\alpha_m}$		
Totals	− (1 + β_m) $\frac{\alpha_s}{\alpha_m}$	− (1 + β_m) $\frac{\alpha_s}{\alpha_m}$	+ 1	+ 1

Sector identification symbols: P(ublic), S(avings bank), M(ember banks), F(ederal Reserve Banks).

Symbols representing monetary-reserve assets per dollar of own liability: α_m, federal funds held by member banks; β_m, domestic balances held by member banks; α_s, federal funds held by savings bank; β_s, domestic balances held by savings bank.

dollar reduction falls upon publicly held demand deposits, and is achieved by an equal reduction of member-bank credit. The contraction also results in a reduction of member-bank domestic balances by β_m (α_s/α_m) dollars.

The net change in outstanding credit resulting from this transfer—called its *credit effect* and denoted by ρ_s—is the algebraic sum of the savings-bank increase and the member-bank reduction:

$$\rho_s = (1 - \alpha_s - \beta_s) - \left(\frac{\alpha_s}{\alpha_m} - \alpha_s\right)$$

$$= 1 - \frac{\alpha_s + \beta_s\alpha_m}{\alpha_m};$$

or substituting from equation (1),

$$\rho_s = 1 - \frac{r_s}{r_m}. \tag{2}$$

The credit effect depends upon the absorption ratios and is positive if the savings bank's ratio is smaller than the member-bank ratio.

The individual who makes the asset exchange sacrifices a one-dollar demand deposit to obtain a one-dollar savings deposit, but the public as a whole does not necessarily make a one-for-one exchange. The net change of publicly held demand deposits can be determined from the information given in Table 2. The net change—called the *demand-deposit effect* and denoted by μ_s—is the algebraic sum of the initial one-dollar sacrifice, the amount passed on to borrowers by the savings bank, and the amount contracted by the member banks:

$$\mu_s = -1 + (1 - \alpha_s - \beta_s) - \left(\frac{\alpha_s}{\alpha_m} - \alpha_s\right)$$

$$= -\frac{\alpha_s + \beta_s\alpha_m}{\alpha_m};$$

or substituting from equation (1),

$$\mu_s = -\frac{r_s}{r_m}. \tag{3}$$

The demand-deposit effect is always negative, but is less than unity in absolute value if $r_s < r_m$. A one-dollar demand deposit passes into the savings bank, (r_s/r_m) of it is lost to the public as a result of reserve adjustments, and the remaining $(1 - r_s/r_m)$ is passed on to borrowers in the form of new credit.[5]

Equations (2) and (3) may be extended to cover exchanges of demand deposits for currency or direct debt. Since currency is federal funds, its absorption ratio is unity, and its credit and demand-deposit effects are $(1 - 1/r_m)$ and $-1/r_m$ respectively. Both are negative, since $0 < r_m < 1$. A withdrawal of currency into public circulation reduces member-bank holdings of federal funds by an equal amount, and results in the familiar multiple contraction of demand deposits and member-bank credit.

Since the issue of new direct debt is an intrapublic transaction which

[5] The credit and demand-deposit effects cover only the immediate changes resulting from a demand-savings deposit exchange. Additional changes will occur if the recipients of the new savings-bank loans, or persons to whom they make payments, exchange a portion of their newly acquired demand deposits for other assets. The effects of subsequent exchanges can be computed from formulas developed in the text if their extent and timing are known. These effects are probably small relative to the immediate effects, and will most likely result in a further credit increase. Exchanges for new direct-debt assets and additional savings deposits would increase, and exchanges for currency would decrease, credit. If the negative effects of currency outflows are offset by Federal Reserve action, as is postulated later, the final result would be a further credit increase.

requires no reserve adjustments by the banks, direct debt has a zero absorption ratio. Its credit and demand-deposit effects are unity and zero respectively. The effects are independent of the member-bank absorption ratio. An existing demand deposit is passed from one member of the public to another. This transaction increases outstanding credit by one dollar, but leaves the demand-deposit holdings of the public as a whole unchanged. These effects are applicable only for new direct debt. If an outstanding liability is exchanged among members of the public, the distribution, but not the amounts, of outstanding credit and publicly held demand deposits will change. If a member of the public sells an outstanding liability to a bank, credit remains unchanged, but publicly held demand deposits increase by one dollar.

TABLE 3—EFFECTS OF EXCHANGING MEMBER-BANK DEMAND DEPOSITS FOR OTHER LIABILITIES

Asset Acquired	Credit Effect	Demand-Deposit Effect
Nonmember demand deposit	+ .61	+ .61
Savings deposits:		
Member banks	+ .66	− .34
Nonmember banks	+ .87	− .13
Mutual savings banks	+ .96	− .04
Savings and loan associations	+ .90	− .10
Currency	−4.46	−5.46
Direct debt	+1.00	0

Source: Computed from the year-end average absorption ratios for 1957 contained in Table 1.

Numerical values for the credit and demand-deposit effects of exchanging member-bank demand deposits for other liabilities have been computed from the average year-end absorption ratios for 1957 and are presented in Table 3. The effects for exchanges of the other liabilities for demand deposits are equal to, but of opposite sign from, those listed in Table 3. The exchange of a member-bank demand deposit for a nonmember demand deposit would result in an expansion of both credit and demand deposits.[6] Since the absorption ratios for savings deposits are substantially smaller than the ratio for member-bank demand deposits, the public as a whole can increase its savings deposits with a relatively small sacrifice of demand deposits. Only ten cents of demand deposits must be sacrificed to obtain an additional one-dollar savings and loan deposit.

[6] The credit effect for nonmember demand deposits is computed from equation (2). Since the liabilities of nonmember banks are demand deposits, their demand-deposit effect is one dollar greater than the amount given by equation (3).

The credit and demand-deposit effects for an asset exchange in which neither asset is a demand deposit are sums of sequential direct effects through the medium of member-bank demand deposits. One asset is exchanged for a demand deposit and the demand deposit is exchanged for the other. Consider the exchange of a member-bank savings deposit for a savings and loan deposit. Using the figures in Table 3, the credit effect is $(-.66 + .9 = .24)$ and the demand-deposit effect is $(+.34 - .1 = .24)$. The effects for such exchanges are always equal in amount, and positive or negative as the absorption ratio for the asset sacrificed is higher or lower than the ratio for the asset acquired.[7]

The credit and demand-deposit effect concepts are easily extended to cases in which the amount of federal funds is variable. The exchange ratios between member-bank demand deposits and other assets may be potential rather than actual. If federal funds are increasing in amount, the public can obtain a new one-dollar savings and loan deposit at approximately the same cost in terms of federal funds as a new .1 dollar-demand deposit. Equivalently, a new dollar of federal funds could support \$55.56, or $(1/r_s)$, of new savings and loan deposits, but only \$5.46, or $(1/r_m)$, of new member-bank demand deposits.

The Limits of Credit Control. Outstanding credit, denoted by L_n, can be expressed as a function of the absorption ratios and public holdings of demand deposits and nonmonetary assets:

$$L_n = \sum_{i=1}^{n-1} (1 - r_i) L_{in} + L_{nn} \tag{4}$$

where L_{in} $(i = 1, \ldots, n - 1)$ is the value of the liabilities of the ith financial institution held as assets of the public and L_{nn} is the public's holdings of direct debt. The public's holdings of currency and other financial assets in turn are related to the volume of federal funds:

$$L_{n+1} = \sum_{i=1}^{n-1} r_i L_{in} + L_{n+1,n} \tag{5}$$

where the subscript $n + 1$ denotes federal funds.

The Federal Reserve authorities exercise an indirect control over credit. They regulate the amount of federal funds [equation (5)] which serves as a constraint upon outstanding credit [equation (4)], but with few exceptions do not control credit directly. The minimum reserve ratio for member banks serves to tighten the relation between the federal-funds holdings and credit extensions of member banks. The relation for other institutions is far less rigid. They can and do allow their absorption ratios to fall in tight-credit situations.

[7] In general, the credit and demand-deposit effects of exchanging asset i for asset j as determined from equations (2) and (3) both equal $(r_i - r_j)/r_m$.

Differential absorption ratios are sufficient to cause major credit-control problems even if the ratios are rigidly maintained. The amount of credit supported by a given amount of federal funds, or the change in credit brought about by a change in the amount of funds depends upon the asset choices of the public. If the public reacts to a tight-credit policy by increasing its proportional holdings of the relatively low funds-absorbing assets, it can obtain more credit from each dollar of funds, and a given variation in the supply of funds will have a correspondingly smaller credit-restriction effect.

The relation of the supply of funds to the volume of credit is loose, bu nevertheless, there is always some volume of funds which will allow the Federal Reserve authorities to achieve any level of credit restriction that they desire. A restrictive policy will increase interest rates and reduce the demand for credit, but will affect mainly the availability and supply of credit.[8] A restriction upon the supply of funds will work upon the public's need for money balances and its desire for a high proportion of liquid assets. As the money supply becomes tighter, the public will become more reluctant to increase its nonmonetary asset holdings at the expense of money balances. The fact that nearly any credit-restriction goal can be achieved is not in doubt, but the amount of funds-restriction necessary to achieve a particular goal is quite uncertain. It might be very large under a system of differential reserves.

The use of credit policy in an aggressive manner is constrained by Federal Reserve responsibilities to the Treasury and the member banks. The responsibility to the Treasury is much less of a constraint today than before the signing of the accord, but it nevertheless still exists. The obligation was changed from that of maintaining government security prices to "maintaining orderly conditions in the government security market" by the accord, and was further weakened to "correcting disorderly conditions" in 1953 [7, pp. 86-90]. Although the term "disorderly conditions" has never been clearly defined, it can be assumed that either a major Treasury refunding failure or a sharp decline in the prices of outstanding government securities would qualify as a "disorderly condition." Therefore, the Federal Reserve cannot be an aggressive seller of governments during periods of Treasury refunding. Furthermore, large-scale open-market sales during a period of general expansion, when commercial banks and other financial institutions are moving out of governments relative to other assets, would most likely lead to a sharp decline in government security prices and thereby create "disorder."

[8] It is assumed that the interest-rate mechanism works imperfectly, and that a tight credit situation is characterized by an excess demand for credit.

The Federal Reserve must also fulfill a number of responsibilities to its member banks. Roosa has distinguished the *defensive* and *dynamic* responsibilities of the Federal Reserve [6]. On the defensive side it provides currency and a system for check collection, and compensates for outside factors which affect member-bank reserves in order to prevent sharp fluctuations of member-bank credit. Its dynamic responsibility is to use its powers to implement a general credit-control policy.

Though conceptually separable, the defensive and dynamic are not independent. Both responsibilities are met simultaneously on a day-to-day basis, mainly through open-market operations. During the postaccord period the Federal Reserve authorities have generally been able to meet their defensive responsibilities, and at the same time, limit the rate of expansion of member-bank reserves. This is about as far as they can or will go. A sharp contraction of member-bank reserves would represent a violation of responsibilities which have not been violated in the past. Reserve requirements have been increased only at times when member banks held large amounts of excess reserves, and open-market sales have not been used to obtain sharp reductions in bank credit.

III. *Postaccord Developments*

The Hold-Tight Policy. The Federal Reserve pursued a goal of credit ease from May 1953 until January 1955 in order to stimulate spending during the 1953-54 recession. Its policy was one of restraint during the remaining 61 of the 80 months from the signing of the accord in March 1951 until November 1957. Ease was again the goal from November 1957 until the fall of 1958 when the System shifted back to restraint.

Discount rates have been changed many times since the accord in order to follow interest-rate changes and indicate Federal Reserve sentiment, but a regulation of the rate of increase of member-bank reserves has been the major means of policy implementation. Open-market policy has been used to "hold-tight" member-bank reserves during periods of restraint, but has not been used to contract them in the vigorous manner suggested in most textbooks. Reserve-ratio reductions were combined with open-market operations to ease the reserve positions of member banks during 1953, 1954 and 1958.

A numerical description of the hold-tight policy is given in Table 4, which lists the absorptions of federal funds by financial institutions and the public for the seven-year period from the end of 1950 to the end of 1957. The absorption figures for financial institutions other than the demand-deposit departments of member banks include both their holdings of vault cash and the federal funds which support their domestic-balance reserves. The figures for member-bank demand deposits cover

TABLE 4—FEDERAL FUNDS ABSORBED BY FINANCIAL INSTITUTIONS AND THE PUBLIC: DECEMBER 31, 1950–1957
(millions of dollars)

Holder	1950	1951	1952	1953	1954	1955	1956	1957
Demand deposits:								
Member banks	15,971	18,045	17,859	17,604	16,610	16,866	17,139	16,931
Nonmember banks	1,148	1,385	1,358	1,335	1,247	1,250	1,386	1,360
Savings deposits:								
Member banks	1,875	2,325	2,462	2,631	2,420	2,493	2,666	2,934
Nonmember banks	191	223	222	230	224	222	246	270
Mutual savings banks	210	241	235	243	240	237	240	247
Savings and loan associations	322	386	453	512	664	703	708	731
Life insurance and pension funds	900	970	1,020	1,070	1,000	1,050	1,030	1,050
Public	23,455	24,325	25,443	26,504	26,129	26,519	26,598	26,526
Totals	44,072	47,900	49,052	50,129	48,534	49,340	50,013	50,049
Annual changes:								
Member banks (demand deposits)	—	+2,074	− 186	− 255	− 994	+256	+273	−208
Other financial	—	+ 884	+ 220	+ 271	− 226	+160	+321	+316
Public	—	+ 870	+1,118	+1,061	− 375	+390	+ 79	− 72
Total change		+3,828	+1,152	+1,077	−1,595	+806	+673	+ 36

Sources: Federal Reserve Bulletin; Federal Deposit Insurance Corporation, *Annual Reports;* Federal Home Loan Bank Board, *Combined Financial Statements;* and "Flow of Funds Tables" in *Federal Reserve Bulletin* (August, 1959).

only those funds which support publicly held deposits excluding Treasury deposits. The figures for the public are merely the amounts of its holdings of currency and coin.

Looking at the annual changes in the lower part of Table 4, the hold-tight policy is first discernible in 1952 when member-bank holdings of funds against demand deposits declined by $186 million. Ignoring 1954, these holdings show year-end variations of less than $300 million from 1952 through 1957. The large decline of reserves in 1954 together with moderate changes in the other years since 1951 suggests a policy of absolute restriction. However, reductions of the legal-reserve ratios in 1953 and 1954 respectively released $1,190 and $1,583 million from legal-reserve status in the member banks. Effective reserves, therefore, have increased by a moderate amount in the period as a whole.

The relatively small variations in member-bank demand-deposit reserves were achieved with much larger variations in the total supply of funds. Other financial institutions increased their absorptions in every year except 1954. The Federal Reserve also compensated for currency drains to the public of more than a billion dollars in both 1952 and 1953, and a drain of $390 million in 1955.

In so far as the Federal Reserve compensates for funds withdrawn from the member banks, the demand-deposit cost of currency for the public as a whole is zero rather than the $5.46 listed in Table 3. The demand-deposit cost of a savings deposit also is reduced since the public now loses only the amount of the demand deposit diverted to the savings bank's domestic-balance reserve. The demand-deposit cost of a one-dollar savings and loan deposit is thus reduced from .1 to .04 dollars.

Table 5 contains average absorption ratios for the eight year-end dates. The ratio for member-bank demand deposits increased as a result of legal-reserve ratio increases in early 1951, declined as the banks reached a very tight reserve position at the end of 1952, increased slightly in 1953 as released reserves were used to increase liquidity, and declined in response to legal-reserve reductions in 1954. The subsequent year-end ratios remained very close to the 1954 level. Changes in the ratio for member-bank savings deposits reflect an increase of the legal-reserve ratio in 1951, and a decrease in 1954.

The absorption ratios for the other savings banks varied in response to variations in the member-bank demand-deposit ratio, but also exhibited independent variations. The ratios for mutual savings banks and savings and loan associations moved steadily downward in response to the tight-credit situation after the end of 1954. The nonmember banks allowed their absorption ratios to decline during the 1955 boom, but restored them in 1956.

Public Reactions. The hold-tight policy was successful in limiting the rate of growth of demand deposits, but had limited effect upon the public's holdings of other financial assets.[9] Table 6 shows that postal savings and government security holdings grew less rapidly than demand deposits from the end of 1950 to the end of 1953 and from the end of 1953 to the end of 1957. Currency holdings also grew less rapidly during the latter period. All other assets increased more rapidly during both periods. The highest growth rates were exhibited by savings and loan and credit union deposits which increased 8.4 and 10 times as fast

TABLE 5—AVERAGE ABSORPTION RATIOS: DECEMBER 31, 1950–1957

Liability	1950	1951	1952	1953	1954	1955	1956	1957
Demand deposits:								
Member banks	.202	.216	.202	.203	.184	.182	.183	.183
Nonmember banks	.078	.087	.080	.077	.070	.068	.072	.071
Savings deposits:								
Member banks	.063	.075	.074	.073	.061	.062	.063	.063
Nonmember banks	.026	.029	.026	.026	.023	.022	.025	.024
Mutal savings banks	.011	.012	.011	.010	.009	.009	.008	.007
Savings and loan associations	.023	.024	.023	.023	.024	.021	.019	.018

Sources: See Table 4.

as demand deposits. Life insurance and pension funds and other direct debt grew rapidly relative to demand deposits, but savings deposits showed the most rapid growth rates among the general asset categories during both periods. At the end of 1957 the public's savings-deposit holdings exceeded their demand-deposit holdings by $14.6 billion. By the end of 1958 this differential had increased to more than $22 billion despite an unusually large increase of demand deposits during 1958.

IV. *The Case for Uniform Reserves*

A Proposal. Changes in public asset holdings and changes in outstanding credit are generally different sides of the same coin. Credit expansion can be regulated only if it is possible to regulate asset expansion. Federal Reserve control is limited to member-bank deposits, principally their demand deposits. The demand-deposit control has both a direct and an indirect effect. The limitation of member-bank credit resulting from a limitation of demand deposits represents the direct effect. The indirect effect is realized in so far as individuals be-

[9] The liabilities of the federal government are included in the public liability (outstanding credit) totals, but government asset holdings are not included in the public asset totals. Government assets are very small relative to government liabilities, and are generally the result of legislation rather than asset choice.

come more reluctant to exchange their limited supplies of demand deposits for other assets. The combination of these effects does not appear overly promising as a basis for future anti-inflation policy. The responsibilities of the Federal Reserve to the Treasury and member banks limit the direct effect, and the experiences outlined in Table 6 cast doubt upon the possibility of a sufficiently compensating indirect effect.

The credit gap resulting from differential reserves can be closed by extending Federal Reserve control to all deposits in order to equalize absorption ratios. Reserve requirements for savings deposits could be

TABLE 6—PUBLIC HOLDINGS OF FINANCIAL ASSETS: DECEMBER 31, 1950–57

Type of Asset	1950	1953	1957	1950–53	1953–57
	(billions of dollars)			(percentage increase)	
Demand deposits:	99.0	108.9	119.8	10.0	10.0
Member banks	*84.9*	*92.3*	*101.3*	*8.7*	*9.8*
Nonmember banks	*14.1*	*16.6*	*18.5*	*17.7*	*11.4*
Savings deposits:	74.1	95.0	134.4	28.2	41.5
Member banks	*29.2*	*34.9*	*45.0*	*19.5*	*28.9*
Nonmember banks	*7.2*	*8.8*	*11.2*	*22.2*	*27.3*
Mutual savings banks	*20.0*	*24.4*	*31.7*	*22.0*	*29.9*
Savings and loan associations	*14.0*	*22.8*	*41.9*	*62.9*	*83.8*
Credit unions	*0.8*	*1.7*	*3.4*	*112.5*	*100.0*
Postal savings	*2.9*	*2.4*	*1.3*	*−17.2*	*−45.8*
Life insurance and pension funds	80.9	102.8	137.7	27.1	33.9
Currency	23.5	26.5	26.5	12.8	0
Direct debt:	202.4	228.5	284.4	12.9	24.5
Federal government securities	*96.5*	*101.4*	*105.3*	*5.1*	*3.8*
Other	*105.9*	*127.1*	*179.1*	*20.0*	*40.9*
Totals	479.9	561.7	702.8	17.0	25.1

Sources: See Table 4.

set in the manner currently used for member-bank demand deposits, i.e., a specified ratio between federal-funds holdings and total deposit liabilities less domestic-balance assets. Equal absorption ratios for demand and savings deposits would then be achieved by setting equal reserve requirements.[10] The establishment of uniform reserves would increase the effectiveness of anti-inflationary credit policy without recourse to direct controls and without creating a policy so severe that its

[10] If savings banks are allowed to offset their domestic-balance holdings, equation (1) becomes

$$r_s = \alpha_s(1 - \beta_s) + \beta_s r_m$$

where α_s now is the savings-bank reserve requirement. The absorption ratio for member-bank demand deposits as a whole remains

$$r_m = \alpha_m. \quad \text{Letting } r_s = r_m, \text{ yields } \alpha_s = \alpha_m.$$

application might result in financial disaster.[11] The case for this proposal is considered on the grounds of direct effect, uncontrolled asset expansion, equity, and convenience.

Direct Effect. The often repeated statement that savings institutions "play a middleman role in conveying to their ultimate users loan funds brought into being by others" [2, p. 120] is true, but frequently serves to obscure a consideration of inflationary credit expansion. The inflationary effects of spending based upon one type of credit are just as great as those based upon another. Effects do not differ because one type of spending is based upon a more active use of the existing money supply and another is based upon an expansion of the money supply.

Money which is placed in a savings deposit may represent savings from current income, but this does not mean that the subsequent spending of this money is not inflationary. The spending-savings relationship works both ways. The public increases its holdings of savings deposits as the money value of its gross savings increases. The money channeled into the savings banks is passed on to borrowers whose spending in turn increases the money value of income and the money value of the public's gross savings. The credit generated by this sequence is largely outside of Federal Reserve control, and is limited only by spending time lags and the public's reluctance to increase its holdings of savings deposits relative to demand deposits. Conditions during the postaccord period have been such that the public has been willing to accept large relative increases in its savings-deposit holdings.

If the absorption ratios for all deposits were equalized, credit effects would equal zero for all deposit transfers [see equation (2)]. Furthermore, the savings banks could no longer increase credit by allowing their reserve ratios to decline during boom periods. A new dollar of federal funds would support a given amount of credit regardless of its ab-

[11] Cf. L. S. Ritter [5]. Ritter has suggested that gaps in credit policy which are reflected by increases in income velocity may be beneficial because: "Changes in velocity . . . provide the needed safety valve, tempering and graduating the impact of monetary policy and thereby enabling the central bank to apply more restraint than it might otherwise risk" [5, p. 127]. Savings deposit expansion, of course, is one of the means by which income velocity has increased in recent years.

It is almost impossible to dispute the general proposition that gaps in the credit control mechanism can serve to compensate for a lack of omniscience on the part of the Federal Reserve authorities. The extent of the gaps necessary for this purpose, however, is not so certain. At the extreme is a credit policy with so many gaps that it has no effect. Current credit policy rests upon a declining base and contains a number of gaps. The central bank must apply vigorous restraint to the money supply and commercial-bank lending in order to have a sizeable effect upon total credit. The declining base and gaps also lead to uncertainty as to the magnitude of the credit effects resulting from a specific action. An adoption of uniform reserves would enlarge the control base, close a very important gap, and thereby allow the central bank to pursue its goals with less vigor and more certainty. A sufficiently large number of safety valves would nevertheless remain.

sorption among the various banks. Furthermore, the public as a whole would have to sacrifice, either actually or potentially, one dollar of demand deposits for each new dollar of savings deposits that it acquired; i.e., the demand-deposit effects of equation (3) would equal unity.

The direct effect of the uniform reserve plan would be based upon a doubling of the volume of credit under the uniform control of the Federal Reserve, and an elimination of credit expansion through deposit transfers and aversely variable reserve ratios. The Federal Reserve authorities could determine the rate of deposit and credit expansion for the commercial and savings banks as a whole by varying the quantity of federal funds. The distribution between demand and savings deposits would be determined by the asset choices of the public.

Uncontrolled Asset Expansion. Creditors generally desire to hold more liquid assets than borrowers desire to issue. The savings banks as well as the commercial banks have profited from the public's desire for liquidity. Savings deposits are fixed in money value, almost always paid on demand, and are, therefore, highly liquid in the eyes of the public. The problems of *time* deposits during the 1930's are becoming a dim memory. Savings deposits do not serve as a means of payment, but have become very close substitutes for the asset functions of demand deposits. Balances classified as precautionary or speculative are probably more frequently held in the form of savings deposits than in the form of demand deposits.

Savings and loan association deposits, which were in relative disfavor after the experiences of the 1930's, have undergone major qualitative changes in the eyes of the public [Cf. 1]. The savings and loan associations have carried out major promotional campaigns in an attempt to convince the public that their liabilities are no different from any other savings deposit, and furthermore, they pay the highest interest rate.[12] The success of their campaigns is witnessed by their growth rate.

Savings deposits have provided highly liquid substitutes for demand deposits for the public's expanding asset portfolios. Life insurance companies are similar to savings banks as grantors of credit, but the assets which they issue to the public are rather remote substitutes for demand deposits. Pension funds, which have been growing much more rapidly than life insurance companies, provide even more remote substitutes. Treasury bills appear to be the major substitute for demand deposits among the direct-debt assets, but by the nature of their market they can be held only by institutions. Other direct-debt assets do not appear to be close substitutes.

[12] In 1958 the savings and loan associations paid an average return of 3.38 per cent on their deposits, contrasted with 2.21 per cent for insured commercial banks and 3.09 per cent for mutual savings banks. See [10, p. 11] and [9, pp. 203 and 221].

The uniform reserve plan would reduce the credit effects of demand-savings deposit exchanges to zero. Positive credit effects would still be realized if individuals exchanged either type of deposit for new direct-debt assets, life insurance reserves, pension fund reserves, or certain other uncontrolled assets. In general, however, the public cannot obtain highly liquid substitutes for demand and savings deposits among the uncontrolled assets. Therefore, total deposit control would not open a new liquidity gap comparable to the gap now provided by savings deposits, and the public is unlikely to respond, to a regulation of the rate of increase of total deposits by accelerating the rate of increase in its holdings of uncontrolled assets. On the contrary, the liquidity squeeze provided by total deposit control may increase the reluctance of many individuals to exchange their limited supplies of deposits for less liquid uncontrolled assets, and thereby spread the base for credit control by indirectly reducing the rates of increase for uncontrolled assets. Life insurance and pension fund assets, which are frequently accumulated automatically, are probably less susceptible to this indirect control than are many of the direct-debt assets.

Equity. The idea that the primary purpose of reserves is the provision of funds to meet unexpected withdrawals has been discarded as a reason for the regulation of member-bank deposits. In the interests of credit control the Federal Reserve requires member banks to hold reserves which are larger than necessary to meet normal withdrawal demands, but stands ready to provide additional funds in cases of unusually heavy withdrawals. As the final source of liquidity for the economy as a whole, the Federal Reserve is required to aid the savings banks in the event of financial crisis. At present the savings banks share little of the responsibility for credit control, but gain most of the benefits provided by the Federal Reserve and other government agencies. The federal savings and loan associations provide a striking example of the inequities in the present system of diverse regulation. The Federal Home Loan Bank Board and the eleven Federal Home Loan Banks provide loans and other Federal Reserve-type services, but do not impose Federal Reserve-type regulations.

Equal reserve requirements for demand and savings deposits are not unknown in this country. The National Banking Act required them, and twelve states currently have uniform requirements [12, pp. 468-69]. The savings-deposit differential was included in the Federal Reserve Act in order to allow member banks to compete for savings deposits with outside institutions [11, p. 957]. This would no longer be a problem if the competing institutions were brought under Federal Reserve control.

Convenience. The uniform reserve plan provides a convenient means

for increasing the effectiveness of credit control because it requires only an extension of the familiar indirect methods already employed by the Federal Reserve. Open-market operations would be used to regulate the federal-funds holdings of the controlled institutions as a whole. All controlled institutions would be able to use the discount window to meet temporary reserve deficiencies.

The regulation of credit based upon nondeposit assets appears possible only if extensive direct controls are instituted. Information gained from past experience with direct controls is not encouraging. They proved difficult to formulate, difficult to enforce, and expensive to administer.

V. *Some Consequences and Problems*

Consequences. A shift to total deposit control would remove the virtual prohibition upon demand deposit growth during periods of credit restraint, and thereby reduce the relative growth advantages of savings deposits. The opportunity cost of holding demand deposits would also be reduced. The savings banks would be required to increase their total monetary reserve ratios, i.e., the proportion of their deposits on which they earn no interest, and therefore would be able to pay somewhat lower rates of return than under the current system.

The savings-deposit gap has become increasingly important as savings deposits have become more and more like demand deposits. The adoption of the uniform reserve plan would not reverse recent growth trends. It would reduce the relative advantages of savings deposits, but savings deposit growth would undoubtedly continue to exceed demand deposit growth if the current narrow differences between the two types of deposits remained unchanged. Savings deposit growth would be further stimulated if the differences continued to narrow.

Many savings banks are trying to devise a means to make their deposits subject to checks drawn outside of their premises. If they are successful, there will be two types of demand deposits, one which pays interest and one which does not. The uniform reserve plan would allow a control of credit effects in this case, but in itself would provide no solution for the impossible position of the commercial banks. However, the existence of a unified Federal Reserve control over all deposits, which would accompany uniform reserves, would provide a means for a regulation of differences between the two types of deposits.

Problems. If uniform reserves were required immediately for all deposits outstanding on the date that the plan was put into effect, the money markets would be thrown into a state of complete disorder as the savings bank sold securities and converted domestic balances in order to increase their funds holdings. There are many possibilities for easing a

transition to uniform reserves. If requirements were set lower than current demand-deposit requirements, the savings banks would need to raise a smaller amount of funds, and the commercial banks would have an excess-reserve margin to cover the conversion of savings-bank deposits to funds. The uniform reserve plan would allow a control of credit effects in this case, but in itself would provide no solution for the impossible position in which the commercial banks would be placed if savings banks paid interest on deposits subject to check. However, placing all deposits under the administrative control of the Federal Reserve would facilitate the regulation of many savings-bank practices.

Problems of equity arise once operating differences between individual banks are recognized, but these are not new problems. Country member banks currently maintain larger domestic-balance reserves than reserve city and central reserve city banks. Equal reserve requirements would force the country banks to maintain much larger total monetary reserve ratios than the other classes of banks, and thereby suffer a much larger relative earnings sacrifice. The lower reserve requirements for country banks are mainly justifiable on equity grounds. Similar equity differentials would have to be established for savings banks. However, these differentials would be small relative to the country-bank differential. Current domestic-balance ratios for savings banks are below the country-bank ratio, and would fall further below if the uniform reserve plan were adopted.

Concluding Remarks. The uniform reserve plan is not presented here with the intention of rousing the readers of this paper into writing their congressmen to urge its adoption. It will not provide a panacea. A number of its consequences and problems require more complete investigation and additional information. Available information, however, suggests promise for the plan, and it is presented as a possibility which deserves further consideration. New information, which is becoming available at an increasing rate, may either strengthen or weaken the case for uniform reserves.

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THE "OUTER-SEVEN" AND EUROPEAN INTEGRATION

By MORDECHAI E. KREININ*

The beginning of 1959 witnessed the first round of tariff reductions and quota increases within the European Economic Community[1] (henceforth referred to as the EEC). While the first removal of trade barriers under the Rome Treaty has been small, its impact upon business practices has been considerable. In anticipation of future intra-EEC tariff cuts, various steps taken by the business community within "the Six" discriminate against nonmember nations. Distributors inside the Common Market, for example, began dropping the products of British and other outside agencies in favor of products of the Six; industrial agreements for joint production and selling were concluded between firms in the Community cutting across national frontiers, but excluding nonmembers; and finally, American investors have recently begun to prefer EEC locations over sites in the United Kingdom.[2]

In response to these initial effects of the Community, and in view of the failure of the negotiation for an all-European Free Trade Area [15, Ch. 4] (of which the EEC was to be part), a rival scheme was devised known as the European Free Trade Area Association [14] (henceforth referred to as the EFTAA). Its members, frequently described as the "Outer Seven," are the United Kingdom, Sweden, Norway, Denmark, Austria, Switzerland and Portugal. The new scheme is not seen as a permanent arrangement. Rather it is supposed to provide a vigorous spur towards a broader all-European agreement [3]. In addition it will give the seven countries a certain compensation for the losses they are suffering from the establishment of the Common Market. The pressure on the EEC to negotiate a broader agreement is to be exerted through discrimination against products of the Six in the markets of the Seven.

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[1] The six members of the Community are: France, West Germany, Italy, Netherlands, Belgium and Luxemburg. Greece and Turkey have asked to be linked to the Community as Associates but not with full membership status [1].

[2] If an all-European Free Trade Area were established, many American investors would prefer British locations, thus gaining free access both to Europe and to the Commonwealth nations.

Although the new scheme is designed to bring Europe closer to an over-all agreement, it may produce precisely the opposite result. Fears have already been expressed in various quarters that establishment of the EFTAA may push the agreement with the Six farther away, thus "deepening and completing the division within Europe" [2, p. 715]. So far, these apprehensions have been mostly intuitive. It is a main purpose of this paper to examine empirically the extent to which they may be justified (Section II). But first we compare the two prospective unions with reference to their impact on the pattern of resource utilization in the world (Section I).

I. *Comparative Welfare Implications of the Two European Unions*

Both the EEC and the EFTAA provide for the eventual abolition of most trade restrictions within their respective areas. Nevertheless there are important differences between them. The Common Market, a customs union, will eventually have a common tariff against outsiders. On the other hand, each of the Outer Seven may maintain its own tariff rates, thus permitting Great Britain to retain its imperial preference system. While the EEC is viewed as a permanent cohesive union, which may eventually lead to a political union,[3] the EFTAA is planned as a looser organization with much more modest and temporary goals. Since the Outer Seven plan to use their union as a stimulus for a wider agreement in Europe, their integration schedule corresponds roughly to that of the EEC. It will be somewhat faster than that of the Common Market, with the first step of a 20 per cent tariff cut to be taken in July 1960. That the EFTAA is considerably smaller, and economically weaker than the EEC is clear from Table 1. Its population is about half, and its GNP is 60 per cent that of the EEC. One nation, the United Kingdom, occupies a predominant position among the Outer Seven. It produces two-thirds of the total EFTAA GNP, and accounts for 57 per cent of the area's total trade.[4] There is no such single predominant nation among the six Common Market countries.

[3] ". . . the common market is primarily political in purpose, and its economic objectives, while of great importance, are nevertheless secondary. The men who were responsible for the Treaty of Rome . . . were inspired primarily by the desire to progress toward political integration, ultimately toward some kind of European federation, some form of a United States of Europe . . . one can say quite categorically that without the political objective there would have been no Common Market and that the six nations which joined in the Treaty of Rome would never have entered into such a revolutionary adjustment of their trade policies if the treaty had contained no political content; if it had been merely a free trade area or a customs union." From a statement by George W. Ball, attorney for the Common Market, before the Joint Economic Committee, United States Congress [5, p. 992].

[4] The predominant position of British trade in the EFTAA is further demonstrated by the fact that, for commodities in which the United Kingdom has a comparative advantage, the entire area's exports exceed its imports. This is not the case for commodities in which other EFTAA members have a comparative advantage (see Section II).

Both unions occupy a major position in world trade, although the EFTAA falls short of the EEC (Table 1) in the proportion of world exports and imports for which it accounts. Their formation is likely to have a significant impact on the pattern of world trade. For this reason it is instructive to focus the comparison of the two unions on their relative impact on the world's welfare.[5] Available data make possible inter-union comparison on the basis of three welfare criteria suggested by Jacob Viner, and a fourth one added by J. E. Meade.

In his pathbreaking work on the theory of customs unions, Viner [17, pp. 41-55] bases the criteria for judging the economic advantage of a customs union on the distinction between the favorable trade-creation

TABLE 1—THE EUROPEAN ECONOMIC COMMUNITY AND THE EUROPEAN FREE TRADE AREA ASSOCIATION—SOME COMPARISONS (1957)

	EEC	EFTAA	U.K.
Population (millions)	165	88	52
Gross National Product ($ billions)	157	95	62
Total exports ($ billions)	22.4	16.3	9.3
Total imports ($ billions)	24.8	20.1	11.4
Proportion of world exports (per cent)	22.7	16.4	
Proportion of world imports (per cent)	23.3	18.8	
Intratrade ($ billions)	7.0	3.2	
Intratrade as per cent of exports	31.3	19.6	
Intratrade as per cent of imports	28.4	15.9	

Sources: (1) OEEC, *Statistical Bulletins, General Statistics*, No. 4, July 1959; (2) OEEC, *The Network of Intra-European Trade, Trade by Product in 1957.*

effect and the unfavorable trade-diversion effect. Trade creation takes place when, as a result of the removal of trade barriers within a customs union, a member country replaces its own high-cost (formerly protected) production by imports from another member of the union. Trade diversion occurs when, as a result of the removal of trade barriers within a customs union, a member country replaces its imports from a low-cost nonunion source, by a higher-cost source within the union.[6] The shift is caused by the newly created tariff discrimination favoring union members. The relative magnitude of the two effects would determine the welfare impact of the customs union.

[5] The word welfare is used loosely here to denote economic efficiency. The discussion ignores the possible impact of regional integration on the distribution of income within and between countries.

[6] This classification is not exhaustive. There can be trade displacement from a high-cost source outside the union to a lower-cost source inside. This can occur, for example, when production costs within the union decline because of economies of scale brought about by the creation of the union. Such a shift is not adverse to welfare.

On the basis of this distinction Viner offers the following conclusions [17, p. 54]:

> A customs union is more likely to operate in the free trade direction. . . . (1) the larger the economic area of the customs union and therefore the greater the potential scope for internal division of labor (the limiting case is a customs union embracing the entire world); (2) the lower the "average" tariff level on imports from outside the customs union area as compared to what that level would be in the absence of the customs union; (3) the greater the difference in unit costs for protected industries of the same kind as between the different parts of the customs union.

It is clear from Table 1 that, with respect to the first criterion, the EEC is likely to be more favorable (or less unfavorable) to world welfare than the EFTAA. Not only is it larger in population and production, but the proportion of its total trade transacted within the area is significantly larger (by 11 to 12 percentage points) than the parallel proportion in the EFTAA, thus leaving less room for trade diversion.

Viner's second criterion which depends on the effect of integration on tariff rates yields no conclusive results, because average tariff incidences are likely to decline in both unions as a result of integration. Official pronouncements in Washington (in connection with the 1958 extension of the Reciprocal Trade Agreements Act) and in Europe indicate a strong probability that the common EEC rates will be reduced through GATT negotiations conducted with the Community as a whole.[7] Indeed, the Community's 10 per cent tariff reduction on January 1, 1959 was extended in part also to third countries. In the EFTAA case, even if nominal rates in individual countries remain intact, one can expect some reduction in effective rates. Unless import controls through certificates of origin are strictly enforced, the lowest tariff that prevails for each commodity will tend to become the effective rate for the entire free-trade area. The rules of origin adopted by the EFTAA require that 50 per cent of the value of a commodity be produced in a member country in order for it to acquire duty-free status. That still leaves some leeway for imports to enter high-duty countries through low-duty countries, if they are embodied in commodities which are processed in the EFTAA and form less than 50 per cent of the value of such commodities. (This

[7] Cf. statement by T. Scitovsky [5, p. 1040]. The basic rule of taking the unweighted average tariff rate of the four constituent customs areas as the common EEC rate may actually result in a small increase of tariffs in the Community. France and Italy will have to lower their tariffs by about the same amount that Germany and Benelux will raise them. Since the first two countries account for 40 per cent of EEC imports and the latter two for 60 per cent, the unweighted average would tend to be somewhat above the average weighted by imports. Assuming however that GATT rules will be followed, this potential increase will be compensated for somewhere in the customs union.

possibility is limited by the small differentials in tariff rates of the major EFTAA nations.) It is, however, impossible to predict the relative magnitude of tariff cuts in the two unions.

Data on production costs which could be used in applying Viner's third criterion are extremely scanty. But such fragmentary evidence as exists suggests that cost differentials are larger within the EEC than within the EFTAA. First, one would expect this to be the case because production is more evenly distributed among the six Common Market nations than among the seven EFTAA nations. Two-thirds of total EFTAA GNP in 1956 was produced by one country (United Kingdom) within which trade is free and costs are presumably equal. Another 20 per cent was produced in the three Scandinavian countries, between which there is free factor mobility (and low tariffs), resulting in a strong tendency toward equalization of production costs. In the EEC, on the other hand, the distribution of 1956 GNP among the four constituent customs areas was as follows: France, 37 per cent; Germany, 33 per cent; Italy, 17 per cent; and Benelux, 13 per cent. Thus, there appears to be more room for cost differentials (weighted by GNP) in the EEC than in the EFTAA.

Furthermore, some inferences can be drawn from comparative tariff rates, if those are taken as an indication of the level of protection necessary to maintain high-cost industries. Table 2 presents average levels of ad valorem import duties for ten West European countries. There appears to be considerably greater dispersion of tariff rates (weighted either by imports or by GNP) among EEC nations than among those of the EFTAA. Disaggregation of the data leaves this result unaltered. On the basis of a study of tariff rates imposed on 570 comparable commodity groups (the five digit SITC) by West European nations,[8] the United Nations' Economic Commission for Europe [15, Ch. 4, p. 15] lists France and Italy as having the highest tariffs in Western Europe; Benelux and the Scandinavian countries (and now Germany), the lowest; while the United Kingdom is ranked between the two extremes (but closer to the lower end).[9] Two points become apparent from examination of this study. First, tariff rates in the Outer Seven are—on the average—lower than rates in the six EEC nations. Second, unlike the EFTAA, the EEC includes both very high- and very low-duty countries. Tariff variations within the EEC are larger than within the EFTAA, leading one to expect larger cost differentials in that area.[10]

[8] The calculations on which the study is based were made by GATT.

[9] This is consistent with specialists' estimates quoted by the Department of Commerce statement: "The Nature and Significance of International Comparisons of Tariff Levels" [4, p. 229].

[10] This argument would be strengthened if Greece and Turkey were to attain associate status with the EEC.

Finally, unlike the EFTAA, the EEC will have free factor mobility in addition to a common commodity market, and is thus likely to attain a higher degree of cost equality.

In a more general way, the fact that EEC tariff rates have been higher than those in the EFTAA implies that the EEC nations have had a better opportunity to develop industries for which they lacked comparative advantage [9, Ch. 3]. Thus the Common Market is more likely to lead to the elimination of such industries. It may therefore be concluded

TABLE 2—AVERAGE AD VALOREM IMPORT DUTIES

EEC Nations				EFTAA Nations			
Country	Tariff Rate	Per Cent of EEC		Country	Tariff Rate	Per Cent of EFTAA[a]	
		Imports (1957)	GNP (1956)			Imports (1957)	GNP (1956)
Italy	25%	40%	54%	United Kingdom	12%	57%	66%
France	24%			Scandinavian Countries (Sweden, Norway, Denmark)	10%	25%	20%
Germany[b]	10%	60%	46%	Switzerland	9–10%	10%	8%
Benelux	9%						

[a] Data are missing for Austria and Portugal. While both are relatively high-tariff countries, they account for only 6 per cent of EFTAA GNP and their omission would not affect the results significantly.

[b] Germany's tariff rates declined substantially in the past few years. In 1952 her average ad valorem rate was 34 per cent.

Sources: (1) Tariff rates in EFTAA except for Switzerland: P. J. Verdoorn [16, p. 489]. (2) Tariff rates in the EEC: G. W. Ball [5, p. 997]. (3) Imports and GNP data: OEEC, *Statistical Bulletins*, General Statistics, July 1958. (4) The tariff rate for Switzerland, relating to 1949, was obtained privately from Hans Wyss, a Swiss economist at the IBRD.

that the EEC would result in more trade creation than the EFTAA, making it more favorable to welfare.

A fourth criterion, offered by Meade, tends to favor the EEC over the EFTAA. This criterion is designed to cope with the following problems left unresolved by Viner: In most cases of customs union formation, both trade diversion and trade creation are present. How can they be weighed as to their relative importance? Moreover, if demand is not of zero elasticity, the removal of a tariff within the union will not only cause a shift in the pattern of trade, but will also result in a price reduction and, therefore, in an increase in the quantity taken. How is that increase to be evaluated? Likewise, if elasticity of supply is short of infinity, an increase in demand on the part of one country for a product of another

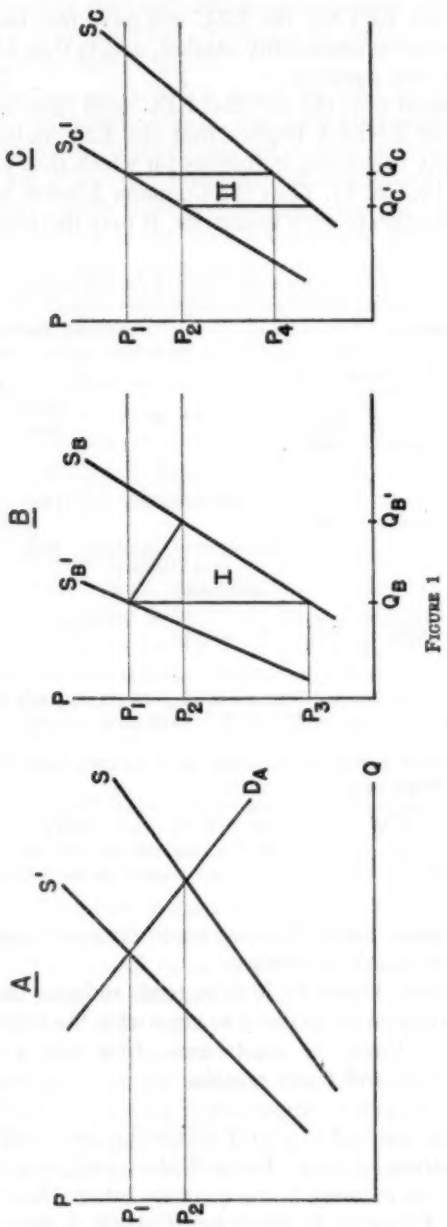

FIGURE 1

country within a newly formed customs union may change cost of production per unit of output. What would be the economic implications of that change?

Using a quantitative welfare approach, Meade's criterion [9, Ch. 3-5] [10, Ch. 7] is based on the divergence between the marginal cost of producing a product and its marginal value to the consumer in the importing country. The divergence is created by the import duty, and is measurable in terms of the rate of tariff yield. If a seller is willing to part with his product for $2, while a buyer is willing to pay $3 for it (the tax being 50 per cent), then—assuming that the marginal utility of money is the same for both—the seller gives up less in terms of utility than the buyer receives. The transaction therefore results in a rise of their combined welfare, and an increase in the number of such transactions will be favorable to welfare.

Using this criterion, trade diversion and creation can be described diagrammatically as follows (Figure 1): Let countries B and C be the suppliers of a certain product to country A, with production costs in C lower than in B. S_B and S_C are the export supply curves of B and C (to country A) respectively, and S_B', S_C' are the same supply schedules taking into account A's duty. S' is the total export supply of both countries B and C in country A, given the duty. Price P_1 is established and countries B and C will export to A quantities Q_B and Q_C respectively.

Producers in B and C, while receiving price P_1, are willing to supply the given quantities for prices P_3 and P_4 respectively. The distance P_1P_3 indicates the amount by which welfare would rise if exports from B to A were increased by one unit. Consumers in A would get a unit which is worth P_1 to them, while sellers in B would give up a unit which is worth only P_3 to them. By the same token, the distance P_1P_4 shows the amount by which welfare would decline if exports from C to A were reduced by one unit.

When A and B establish a customs union to the exclusion of C, B's export supply schedule shifts to S_B, while C's supply curve remains S_C'. The total import supply curve in A becomes S. It results in a new, lower price P_2, in an increase to Q_B' of B's export to A, and in a decline to Q_C' of C's export to A. Triangle I measures the trade-creation effect,[11] and area II the import-diversion effect. The more elastic is D_A, the larger will be the trade-creation effect, and the smaller will be the import-diversion effect. Likewise, the more elastic is S_B the larger the trade-creation effect. A similar diagram can be drawn to depict export diversion.

[11] The triangle is constructed as follows: a straight vertical line connects S_B' at height P_1 with S_B, while the upper line, parallel to D_A, connects S_B' with S_B at heights P_1 and P_3 respectively.

In shifting towards a new general equilibrium, the following effects of a customs union must be considered: trade creation within the union, trade diversion between member and nonmember countries, and changes in the direction of trade involving only nonmember nations.[12] Any shift in trade from countries between which there exists a small divergence between marginal cost and marginal value (i.e., low import duty) to countries between which the divergence is large, would have a favorable effect on welfare in proportion to the volume of trade in the commodity. The welfare effect would be unfavorable for shifts in the opposite direction. The quantitative impact of each shift can be measured in terms of the areas involved, as in Figure 1. A comparison between the "favorable" and "unfavorable" areas would yield an estimate of the total welfare implications of the customs union.

TABLE 3—PERCENTAGE DISTRIBUTION OF INTRA-UNION TRADE AMONG COMMODITY GROUPS (1957)

Commodity Group	SITC	Percentage Distribution	
		Outer Seven	Common Market
Food, beverages & tobacco	(0, 1)	15.9%	14.0%
Crude materials	(2)	17.8	10.2
Mineral fuels	(3)	8.4	11.2
Oils & fats	(4)	0.7	0.6
Chemicals	(5)	6.4	6.6
Machinery	(7)	21.5	21.7
Manufactures	(6, 8)	29.3	36.3
		100.0%	100.0%
Total Intra-Union Trade ($ millions)		3,186.7	6,992.9

Source: OEEC, *The Network of Intra-European Trade, Trade by Product in 1957.*

The size of the areas for each commodity depends on the quantity of trade shifted as well as on the tariff rates which are associated with each shift. The 1952 U.N.-GATT study [15, Ch. 4, pp. 12-16] showed that European tariff rates tend to be highest on finished manufactures and lowest on crude materials. At the same time, Table 3 shows that manufactures account for a larger proportion of intra-EEC trade than of intra-EFTAA trade, while the reverse is true for crude materials. Relatively speaking, therefore, commodities with high-tariff incidence weigh more heavily in intra-EEC trade than in intra-EFTAA trade. This, coupled

[12] These changes represent Meade's primary and secondary repercussions. His tertiary repercussions, involving the reaction of individual countries to changes in their balance-of-payments position caused by the formation of a customs union, are excluded from this discussion.

with the fact that the Common Market nations tend in general to have higher tariff rates than their EFTAA counterparts, shows that each "unit" of trade creation in the EEC would tend to have a higher weight (measured by the tariff rate along the coordinate of the central part of Figure 1) than a similar unit in the EFTAA. By the same token, the fact that manufactures weigh more heavily in intra-EEC trade than in intra-EFTAA trade, suggests that S_B would be more elastic in the EEC, leading one to expect a greater magnitude of trade creation in that union.[13] Although based on aggregate rather than on detailed statistics,[14] these observations suggest that the favorable Area I would be larger in the EEC than in the EFTAA.[15]

Finally, on the basis of his welfare criterion Meade concludes that the abolition of import quotas within a customs union would invariably lead to an increase in welfare. The argument was effectively summarized by Sannwald and Stohler [12, pp. 66-67] as follows:

> Let country A import steel from B and C and assume that there are quantitative restrictions on the imports from both countries. . . . If these restrictions are removed on the imports of steel from B but not on those from C . . . there will be no decrease in steel exports of C to A as long as A's quota effectively restricts the demand for steel from C. If this demand diminishes it means that the quota has become ineffective and could be removed, so that a possible reduction in the trade leaves economic welfare undisturbed [i.e., at this point there is no divergence between marginal cost and marginal value, namely the trade reduction has a zero "weight"]. . . . The primary expansion of the trade between the partners would incontestably increase welfare and there would be no repercussions except in markets in which there are no or ineffective quotas. In any case, these reactions do not affect economic welfare.

Regional integration can affect quotas imposed on intra-union trade as well as those imposed on imports from outside countries. Both the

[13] The number of trade units created depends also on the elasticity of demand for imports in the integrating nations (D_A in Figure 1). Since manufactures, machinery and chemicals account for the same proportions of *total* imports in the two unions, there are no a priori grounds for expecting demand elasticities to be higher in one union than in the other.

[14] To get detailed estimates of the size of the "areas" involved, one would need the changes in the quantity of each commodity traded and the tariff rate associated with that change. The first datum could be approximated if we knew the elasticities of demand and supply for each product. The second datum would have to be derived from official statistics. Existing tariff rates, however, apply usually to much more refined commodity classes than the commodity trade data. The need for comparable groupings would involve both a further breakdown of the commodity trade statistics (e.g., to the 570 items in the five-digit SITC) and calculations of approximate tariff incidence levied on each item by each of the trading nations.

[15] With regard to import and export diversion, the evidence concerning the relative "weights" and the relative quantities of trade diverted is mixed and does not lend itself to an a priori statement about the probable comparative effects of the two unions.

EFTAA and the EEC call for abolition of quotas within their respective areas. While it is impossible to construct a precise measure of the relative potential for quota increase within the two unions, a rough comparison shows that such increases may be larger in the EEC than in the EFTAA. The comparison is based on the percentage liberalization of intra-OEEC trade achieved by each member country late in 1958. These percentages ranged from 81 (Norway) to 94 (U.K.) per cent in the EFTAA, and from 90 (France[16]) to 99 (Italy) per cent in the EEC [11, p. 180]. For each country in the two unions, the difference between 100 per cent and the percentage liberalization attained prior to integration was multiplied by the dollar value of its 1957 imports from other union members. The resulting product, which may be taken as an indication of the potential increase in intra-union quotas, is 20 per cent larger in the EEC than in the EFTAA.[17] (It should be emphasized that these rough calculations abstract from numerous problems involved in interpreting the liberalization percentages. They therefore cannot be taken as conclusive evidence). Moreover, the leverage for extending quota benefits to outside nations is also likely to be greater in the EEC than in the EFTAA. The initial 20 per cent increase in quotas within the Community on January 1, 1959 was extended in part to nonmember countries, thus bringing about more liberalization than can be expected of the EFTAA. The extention also attests to the EEC commitment to pursue a (common) liberal external trade policy. This may not be the case in the EFTAA where each member will follow an independent policy toward third countries (this statement is confined to quota increase which can be attributed to the integration movement).

On balance, the evidence assembled here demonstrates that the Common Market is more likely than the Outer Seven to have a favorable impact on the utilization of resources in the world. Moreover, the EFTAA seems to have very few of the prerequisites for a favorable welfare effect. A tentative (qualitative) judgment can be made that integration of the Outer Seven may reduce rather than increase international specialization.[18] (This view seems consistent with, but does

[16] In 1957 France suspended her earlier liberalization of quotas on imports from OEEC member countries. However at the end of 1958, with the devaluation of the franc, 90 per cent liberalization was restored. While this restoration coincided with the introduction of the Common Market, there was no direct link between the two events.

[17] On the average, the percentages relating to EEC nations were somewhat smaller than those of the EFTAA countries. But the difference was more than counterbalanced by the larger amount of intra-EEC trade.

[18] A fifth welfare criterion, adopted by both Viner and Meade, would lend further support to this judgment. It states that the more competitive the nations composing a customs union, the more likely is the union to be favorable to welfare. As shown in Section II, the economies of the Outer Seven are highly complementary, and therefore are not likely to

not depend on, a quantitative estimate constructed by Scitovsky [13, pp. 64-76] that a customs union embracing *all* of Western Europe is likely to be neutral to welfare.[19])

This is not to deny the probable existence of other favorable effects since not all possible repercussions were considered here.[20] One example is the possible increase in internal competition which would reduce domestic divergences between marginal costs and marginal values caused by monopoly power. The relative effect of the two unions on such internal divergences would depend on the degree of monopoly existing prior to integration and on their ability to enforce proper rules of competition. A second factor is the relative effect of the two unions on international investments. To the extent that regional integration brings about capital flows from capital-rich to capital-poor countries, it is beneficial to welfare since it tends to equalize factor prices. To date the Six seem to have exceeded the Outer Seven in attracting U.S. investments, in infusing capital into their depressed areas, and in promoting outflow of capital to underdeveloped countries. But this position may be reversed once the EFTAA becomes viable (and would rate further investigation at a later date). Other considerations include the greater opportunities for economies of scale provided by integration and a possible favorable terms-of-trade effect (Meade's tertiary repercussions).

Nevertheless, in light of its possible adverse effect on international specialization, and in view of the need to avoid political division within Western Europe, it is important that the EFTAA should not remain a permanent organization. Whether or not the Outer Seven are likely to help attain the goal of an all-European union is the question examined next.

II. *The Outer Seven and an All-European Free Trade Area*

We shall first explore the degree of complementarity of the seven nations composing the EFTAA; and subsequently, the degree of rivalry between the two unions. The data used are from the OEEC *Statistical Bulletins* on foreign trade (Series IV) relating to 1957. These bulletins provide a breakdown of each member country's imports and exports into 260 commodity groups (the three-digit Standard International Trade Classification, with a further breakdown for many groups to the

increase international specialization. This criterion, however, was strongly criticized by Makower and Morton [8].

[19] This estimate was rejected by H. G. Johnson in a review of Scitovsky's book [6].

[20] Excluded from the discussion in this paper are the overseas territories of the West European nations. This exclusion resulted in part from uncertainty regarding the eventual status of some territories and their form of association with the two unions.

five-digit classification). The export/import ratio for each commodity was used as an indication of the comparative advantage of a country in producing that commodity;[21] the higher the ratio, the more likely is the country to have a comparative advantage. Some weight was also given to the absolute amounts of exports and imports. Of the EFTAA nations data are available for only six: Switzerland does not provide a breakdown of its trade by commodity components. Selection of the products for which each nation has a comparative advantage reveals

TABLE 4—PERCENTAGES OF EFTAA[a] EXPORTS AND IMPORTS ACCOUNTED FOR BY COMMODITIES IN WHICH ONE, TWO OR THREE OR MORE COUNTRIES HAVE A COMPARATIVE ADVANTAGE (1957)

	Per Cent of Outer Seven	
	Exports	Imports
One Country	*76%*	*58%*
United Kingdom	55	22
Denmark	6	11
Norway	3	6
Sweden	5	7
Austria	4	5
Portugal	3	7
Two Countries	*15*	*12*
Three or More	*4*	*2*
No Advantage	*4*	*30*
	100%	100%

[a] Switzerland is excluded.

Source: Based on calculations of data derived from the 1957 OEEC *Statistical Bulletins, Foreign Trade*, Ser. IV, 1957.

that 76 per cent of the total EFTAA exports consist of commodities in which only one of the six countries has a comparative advantage (Table 4). By far the largest share is that of the United Kingdom; that share (55 per cent) consists mainly of chemicals, machinery and manufactures (items 5, 6, 7, 8 in the first-digit SITC). Commodities for which Denmark has a comparative advantage consist mostly of food items (number 0 in the first-digit SITC). Sweden's 5 per cent are mainly crude materials (item 2), while for the remaining countries the commodities in the case of which they have a comparative advantage represent all major categories. Commodities for which two of the six nations have a comparative advantage consist of foods, machinery and manufactures. Finally, only 4 per cent of the EFTAA exports consist of commodities in which three or more members have comparative advantage.

[21] A similar procedure was followed by H. H. Leisner [7].

These figures indicate the extreme complementarity of the economies composing the EFTAA. They show that, from the point of view of domestic political pressures, it should not be difficult to establish the EFTAA. This is not to claim that problems do not exist. Such a thorny issue is the Danish demand for British concessions in the case of certain agricultural products. But if we disregard the agricultural field (and the EFTAA may very well exclude agriculture), it seems that domestic pressures should be at a minimum.

TABLE 5—DEGREE OF COMPETITION AMONG THE TWO EUROPEAN UNIONS

	EEC			EFTAA		
	Proportion of Total		Ratio of % of Exports to % of Imports	Proportion of Total		Ratio of % of Exports to % of Imports
	Exports	Imports		Exports	Imports	
1. Commodities in which both ECM and Outer 7 have no comparative advantage	13%	55%	0.24	13%	48%	0.27
2. Commodities in which ECM and Outer 7 are competitive	65%	28%	2.30	67%	28%	2.42
3. Commodities in which ECM has comparative advantage over Outer 7	18%	9%	1.93	8%	18%	0.46
4. Commodities in which Outer 7 has comparative advantage over ECM	3%	7%	0.48	14%	6%	2.19
Total[a]	100%	100%		100%	100%	

[a] Totals deviate from 100% because of rounding.
Source: OEEC, *Statistical Bulletins, Foreign Trade*, Ser. IV, 1957.

As a second step, using the export/import ratio for each commodity for the union as a whole, we listed the products for which: (a) both unions have a comparative advantage and therefore would tend to be competitive; (b) neither of the two unions has a comparative advantage; and (c) only one union has a comparative advantage. Table 5, which summarizes the results of these calculations, shows that in products accounting for 65 per cent of Common Market exports and 67 per cent of EFTAA exports both unions have a comparative advantage. The ratio of total exports to total imports of these commodities is 2.4 in the Common Market and 2.4 in the EFTAA. On the other hand, 13 per cent of EEC exports and the same proportion of EFTAA exports

TABLE 6—COMMODITY COMPOSITION OF THE TWO UNIONS' EXPORTS

	SITC Number	Commodities for Which the Two Unions				Commodities in Which EEC Has Advantage over EFTAA		Commodities in Which EFTAA Has Advantage Over EEC	
		Are Competitive		Have No Comparative Advantage					
		EEC Exports	EFTAA Exports	EEC Exports	EFTAA Exports	EEC Exports	EFTAA Exports	EEC Exports	EFTAA Exports
Food, beverages and tobacco	0, 1	2.3%	2.4%	3.6%	4.0%	4.3%	3.1%	0.9%	1.8%
Crude materials	2	0.6	0.4	4.0	4.2	0.0	0.0	1.0	6.7
Mineral fuels	3	0.1	0.1	2.3	0.8	5.7	2.4	0.0	0.0
Oils and fats	4	0.2	0.2	0.5	0.5	0.0	0.0	0.0	0.0
Chemicals	5	5.1	5.3	0.0	0.0	3.5	1.6	0.0	0.0
Machinery	7	24.9	31.6	0.0	0.0	0.0	0.0	0.1	1.4
Manufactures	6, 8	30.9	25.7	2.4	3.2	4.3	1.4	1.4	3.9
Miscellaneous	9	0.9	1.6	0.3	0.2	0.0	0.0	0.0	0.0
Total		65.0%	67.3%	13.1%	12.9%	17.8%	8.5%	3.4%	13.8%

Source: See Table 5

consist of commodities in which neither of the two unions has a comparative advantage, with a total export/import ratio of .24 and .27 respectively. The remaining products, accounting for about one-fifth of the exports of the two unions, are those in the production of which only one union has a comparative advantage. These figures demonstrate that once the two rival schemes are completed they will be highly competitive with each other. It would thus be in the interest of European producers to strongly oppose unification of the two unions. Not only will the EFTAA impose two adjustment processes on Europe's economies in their path towards all-European integration, but, because of the competitive nature of the two unions, integration between them will be very difficult to achieve.

This analysis is subject to the limitation that the classification of internationally traded commodities into 260 groups may not be sufficiently refined to prove inter-union rivalry (a limitation which does not apply to the case of complementarity). But no finer breakdown is available. Also, the rivalry conclusion would hold even if we allowed for a considerable margin of error. At the risk of further aggregation the point made in the last paragraph can be strengthened. Table 6 presents a distribution of the eight "export percentages" of Table 5 among the major commodity categories. The overwhelming majority of the products in which the two unions are competitive are manufactures, machinery and chemicals. But Table 7, which shows the interunion trade relationships, demonstrates that it is precisely in these categories that the two unions' imports from each other weigh heavily. This means that producers within each one of them have much to lose from economic integration with the other. On the other hand, with regard to their export trade, it is in food, crude materials, minerals and oils that

TABLE 7—EEC-EFTAA TRADE RELATIONSHIPS (1957)

	EEC		EFTAA	
	Exports to EFTAA as Per Cent of All Exports	Imports from EFTAA as Per Cent of All Imports	Exports to EEC as Per Cent of All Exports	Imports from EEC as Per Cent of All Imports
All commodities	22.9	14.9	22.9	25.5
Food, beverages & tobacco	26.9	9.9	28.1	12.5
Crude materials	27.2	14.1	53.8	8.3
Mineral fuels	32.5	2.6	22.3	21.8
Oils & fats	27.2	7.9	34.5	13.3
Chemicals	21.8	22.6	19.4	47.0
Machinery	21.3	26.6	15.2	51.7
Manufactures	20.8	23.7	20.7	41.7

Sources: (1) OEEC *Statistical Bulletin*, July 1959; (2) OEEC *The Network of Intra-European Trade, Trade by Product, 1957.*

interunion exports carry most weight. These are items in which the two unions are least competitive (either neither of them has a comparative advantage or only one of the two does), and (disregarding food) on which European tariffs are very low to begin with. Their producers therefore do not stand to gain much from integration of the two unions. We can conclude that once the two unions are established, there is likely to arise substantial political pressure within each of them against further integration, with a much weaker counterpressure favoring such integration. Thus unification of the Outer Seven would probably lessen rather than increase the feasibility of an all-European free trade area. Unless a link between the two unions is established early in the transition period, the creation of the EFTAA is likely to deepen the division within Europe.

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WESTERN DEVELOPMENT OF A SPARSELY POPULATED COUNTRY: THE RHODESIAS

By STEPHEN ENKE*

There are still some parts of the world which are not depressed by overpopulation and where economic development involves a twentieth-century form of pioneering. In these areas there is some indigenous population, but it is sparse and of very primitive culture, so that development requires immigrants of Western culture. In the last century this was true of New Zealand, British Columbia, and what is now the Union of South Africa, despite the sporadic opposition of Maori, Siwash, and Bantu respectively. Modern examples are Queensland, parts of northwest Canada, and the Rhodesias. To some extent, all these regions have similar characteristics, and so it may be useful to make a case study of the Federation of Rhodesia and Nyasaland.[1]

The following are some of the main requirements for economic development in this kind of country: First, more people having the education and skills, ability to organize, and knowledge of government that is part of Western civilization; in practice this means encouragement of selective immigration, but "Westerners"[2] insist on all sorts of amenities which in return require a great deal of social overhead capital. Second, profitable export opportunities, to attract needed immigrants and capital; but specialization on a few exports means that a wide range of goods must be imported in volume, and high import propensities in-

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[1] This was constituted in 1953 and includes the self-governing territory of Southern Rhodesia and the Colonial Office-administered territories of Northern Rhodesia and Nyasaland. The author wishes to acknowledge the assistance of the following, none of whom is necessarily responsible for the views expressed here: R. J. Randall, Economic Section, Prime Minister's Office; B. J. P. Woods, statistician, Bank of Rhodesia and Nyasaland; Duncan Anderson, chairman, Federal Power Board; Osborne Bellington, assistant director, Central Statistics Office; Colin Kirkpatrick, Board of Directors, Rhodesian Selection Trust; William Taylor, senior lecturer, University College; Clyde Sanger, assistant editor, *Central African Examiner;* F. H. Hartley, director, Municipal Native Affairs Department, Salisbury; Vernon Brailsford, federal director of information; J. A. Scholtz, chief of studies, Roan Antelope Mine; A. Torrance, African personnel manager, Mufilira Mine; R. S. Arnot, chief engineer, Rhodesia Congo Border Power Corporation; the staff of the Federal Archives, and many others in the Federation.

[2] "Westerners" refers to people who are descended from Western Europeans, belong to their culture, and are white; in Africa they are called "Europeans." I shall use both terms in this sense.

crease the export burden of serving an external debt. Third, a continued and rather steady inflow of capital for several decades, for extra exports can only slowly be substituted for foreign capital; any large interim reduction in capital inflows would drastically reduce domestic economic activity. Fourth, participation by the indigenous population in the market economy of the Westerners; there will be an inadequate labor supply and racial unrest if natives cannot share in the material benefits of economic development. In the following sections, the problems of development in the Federation will be examined in relation to each of these general requirements in turn.

Most of the points can be made by description and the presentation of data. However a model is needed to explain why such an economy, with its high import propensities, must increase its exports by several times any increment in external debt service *and* is so dependent upon continued capital inflows to sustain personal incomes. The macroeconomic model developed here for the Federation's economy treats exports and net capital inflows as basic injections and imports as a leakage. Various parameters, linking each of these elements with one another and with personal income, are estimated.

I. *Economic Development by Western Immigrants*

Economic development of the Federation is of recent origin. There was no permanent white settlement until 1890 when the armed Pioneer Column entered Southern Rhodesia. Seventy years ago the site of Salisbury—today's federal capital and a city with an impressive skyline—was a bare and uninhabited plain. Some of today's "copper-belt" towns in Northern Rhodesia did not exist twenty-five years ago.

Since 1953 the Federation's economy has been experiencing one of the highest rates of gross investment in modern times. This has equaled at least one-third the gross domestic product and over half the aggregate personal consumption. Three-fourths of this gross investment is estimated to be net of depreciation. Gross domestic product has increased from £300 million in 1954 to £361 million in 1958, with an intervening peak of £379 million in 1957.[3]

This extremely rapid development has been closely and inevitably associated with immigration of Westerners. These people, apart from some that migrate between the copper mines and the Union, have come to settle. Most of them comprise young families from Great Britain. Some of the attractions are higher real wages, greater freedom from government controls, lower taxes, a better climate, and availability of

[3] Unless otherwise specified, the data that follow refer to the entire Federation, which includes Nyasaland; but economically the latter is of minor importance, the main economy being in the more settled Rhodesias.

African domestic help. During the peak year of 1957 such immigration amounted to 8 per cent of the Western population. In the two Rhodesias, out of a total population of roughly 5 million, about 1 in 20 is now "European" (i.e. white). Nyasaland, with a more primitive economy, has a very small white population. The population density of the Federation is only about 10 per square mile.

Economic development in the Federation, at the present stage of the native African's culture, is inconceivable without the government, management, skills, capital, and social values of Westerners. The indigenous natives, despite rapid advancement, are still only a few generations from cannibalism and slavery. Their agriculture has no tradition of permanent cultivation or systematic irrigation. A majority of the men have only a limited usefulness as laborers at rough work, although a minority are now acquiring skills, especially when not blocked by European trade unions. Technical knowledge and managerial procedures, so important a part of today's industry and commerce, will be quite beyond the average native for some time to come. Socially, it is unfortunate that economic progress can only occur through the immigration of managers, technicians, business men, farmers, and shopkeepers of an alien culture and different race. But this is an economic necessity if there are to be schools and other social services for the natives—largely financed by European taxpayers—and if the region is not to retrogress economically.

The governments concerned are anxious that immigration should continue despite the recent political unrest in Nyasaland. They do not wish it to slacken for lack of amenities adequate for Europeans. Unfortunately, in the case of countries of small and primitive native population, such immigrants require a lot of new capital just to live. Whole cities and transportation systems have to be built for them and they require schools and hospitals. In recent years housing alone has probably accounted for about 20 per cent of total gross investment.

In most countries a majority of Western immigrants are lower middle class and possess very limited savings. If they are employees of some large Anglo-American mining concern, there will probably be a company township to receive them. However, where enterprise is small or agricultural, there will have to be bond issues for roads, utilities, schools, etc. Not only are immigrants necessary and expensive, but typically they do not bring with them enough personal savings to finance the housing and social overhead capital that they demand.[4]

[4]The Federation has many ties with the United States. This is partly because its two major exports—copper and tobacco—are also products of the United States but not of Great Britain, and so technical know-how had to be imported from the United States. The pioneer life, too, is in many ways reminiscent of North America a century ago.

II. *The Importance of Current and Future Exports*

Profitable exports are a condition of rapid economic development in areas of primitive culture and sparse population. In this respect the Rhodesias are no exception. Their export industries serve not only to attract immigrants, both directly and indirectly, but they explain the availability of capital from abroad for industrial and agricultural investment and for social overhead projects. Exports constitute the foundation of such economies during their early development. It is only later that this extreme degree of specialization is mitigated and the import propensity of the economy is lessened.

Few Major Exports

At present the industries earning substantial export credits are few in number, and likely to remain so; even if certain domestic light industries do develop in time, high transportation costs are likely to confine their products to the home market.

Exports exceeding £1 million in 1958, listed in order of value, are: electrolytic copper, blister copper, unmanufactured tobacco, raw asbestos, chrome ore, tea, maize, zinc bar and ingots, cobalt metal, apparel, ferro chrome, and lead bar and ingots.[5] Copper, over half of which in weight and value is electrolytic, accounted for £115 million, or 63 per cent of all exports during 1956, but less in subsequent years. Tobacco has accounted for another 15 to 20 per cent in most years.

Unfortunately, copper has a notoriously fluctuating price. For electrolytic copper the average export price per short ton was £291 in 1956 and £172 in 1958. Tobacco exports are subject to unanticipated percentage changes in output of almost comparable magnitude. And all the Federation's exports of any consequence are always subject to price declines associated with business recessions abroad.[6]

Specialization Makes Debt Service Unexpectedly Onerous

Because there are profitable export lines, production is extremely specialized, and there is a marked dependence upon imports. Specialization is of course typical of any export economy during early stages of development. However, as in most "dualistic" countries, this is complicated by the relatively small number of Westerners and their relatively high incomes. On one hand, there are not enough Westerners to

[5] Other exports, in descending order of value in the same year were: cattle hides, coal and coke, cotton piece goods, maize, radios, cigarettes, meat, and footwear, all mostly exported to neighboring African countries.

[6] The distribution of exports is about 50 per cent to the United Kingdom, under 10 per cent to the United States, followed by the Union of South Africa, the Federal Republic of Germany, and India.

justify domestic production of the things on which they spend most of their incomes. On the other, the not inconsiderable total purchasing power of the black Africans is concentrated on a few goods, so that it does become economical to make some of them locally. For example, bed sheets (for whites) will not be home produced, but simple cooking utensils (mostly for blacks) will be.

The Federation, except for certain sumptuary goods for the black African market, imports a very high proportion of the producer goods and consumer goods that it uses. Hence any increase in gross domestic product is likely to lead to induced imports. Not only will the extra copper and tobacco output for example require more imports—e.g., capital equipment and petroleum products to produce them—but resultant increases in wages and local profits will be spent on cars, furniture, clothes, etc.

Hence, to earn a given value of foreign exchange for debt service, there must be a much greater increase in gross exports. For instance, if £100 of extra exports tend to be associated with about £75 of extra induced imports, the economy will have to produce extra exports valued at £240 yearly to service annually a £1000 debt nominally requiring interest and principal payment of £60.

A developing country such as Rhodesia must obtain most of its capital initially from abroad, because the small immigrant population brings inadequate capital with it. And, taking the economy as a whole, it must be able through exports to pay a return to nonresidents on borrowed capital. This is so whether or not the capital they have lent has been invested in producing exports. Fortunately, for many decades, the economy need make no net capital repayments so long as foreign investors are obtaining a return and feel that their investments are safe; in fact, over short periods of time, a return on past foreign investments may be currently financed by continued capital inflows.

During recent years the Federation's "export rate of return" on total capital inflows has been roughly 10 per cent. This is obtained by dividing the increase in exports from 1954 to 1958 (line 1, Table 1) by net capital inflows during 1954 through 1957. Arithmetically, it is 9 per cent if only net long-term capital movements are considered, and 8 per cent if short-term capital movements are included. While the actual increase in exports may seem respectable it must also cover extra *induced* imports.

Estimating Necessary Gross Export Ratios

The extra exports needed to finance one pound sterling of extra debt service are here considered to be the reciprocal of one minus the propensity to import. The propensity to import is taken to be the ratio of an-

nual imports to what are here termed annual gross injections. Gross injections are defined as the sum of exports and gross investment. *If* relations are stable between producer-goods imports and gross injections, between consumer-goods imports and personal income, and between personal income and gross injections, we can perhaps surmise something about the imports that will be induced by the export component of gross injections.

Pragmatically, the existence of stability among these relations may

TABLE 1—NATIONAL INCOME AND TRADE MAGNITUDES AND COEFFICIENTS

(pounds in millions)

	1954	1955	1956	1957	1958
Categories:					
1. Exports,[1] E'	116.7	125.2	124.9	142.9	134.5
2. Gross investment, K	86.0	113.1	144.2	151.6	128.3
3. Gross injection, I_g	202.7	238.3	269.1	294.6	262.8
4. Personal income,[2] Y_p	187.9	208.5	236.6	255.5	268.7
5. Imported producer goods, M_p	73.7	80.7	99.4	109.5	NC
6. Imported consumer goods, M_c	78.2	91.5	95.6	107.4	NC
7. Total imports, M	151.9	172.2	195.0	216.9	196.0
8. Current transfers (net)	+2.8	+3.1	+3.8	+2.8	+4.4
9. Undistributed profits, etc.[3]	21.1	33.0	32.7	2.1	2.3
10. Current Account	−11.3	−10.9	−33.6	−70.0	−54.8
Coefficients:					
11. M_p/I_g	.37	.34	.38	.37	.74
12. M_c/I_g	.37	.36	.37	.37	
13. Y_p/I_g	.94	.87	.85	.87	1.02
14. M_c/Y_p	.42	.42	.41	.43	NC[4]

[1] Goods and services gross, income payments net, minus undistributed profits of companies.
[2] Income earned from labor and property in the Federation.
[3] Undistributed profits of companies and statutory bodies, mostly held in London.
[4] NC, not comparable.
Line (3) = (1) + (2)
(10) = (1) − (7) + (8) + (9)
Source: Annual federal *Economic Report.*

be as important as the validity of their explanation, and so it is reassuring that Table 1 indicates that most ratios vary little from year to year: producer-goods imports and consumer-goods imports tend to be .36 and .37 respectively of gross injections each year. Thus extra exports of £100 will perhaps induce extra imports of £73 and so improve the merchandise trade balance by only £27. The ratio of necessary gross exports to debt service is then $1/(1 - .73)$, or a little less than 4. The algebra is given in the appendix.[7]

[7] In obtaining these coefficients, and because of the manner in which the large Northern Rhodesian mining companies operate, certain adjustments had to be made in the data. These copper companies, although legally registered in the Federation, are in effect "foreign"

Some Practical Consequences

Countries that have a high rate of induced imports should take this into consideration in assessing the ability of the home economy to service external debt. So should the agencies that lend to these countries. Exports may have to increase by an amount several times greater than is commonly supposed.

The Kariba project to dam the Zambesi, thereby producing electric power, may or may not be a case in point. The immediate effect on merchandise trade is slight, some imports of electric power from the Congo perhaps being eliminated. However, as a result of more abundant power, more copper may be exported in future years. Also coal may be released for export. Cheap and plentiful power may stimulate some new industries replacing imports. New borrowing to expand railroad capacity may be obviated. Nevertheless, if now-contracted interest and principal payments are to be met without depressing the balance of the economy, by around 1970 additional exports somehow attributable to Kariba and amounting to about £25 million a year may be needed. This "economic" requirement, for reasons explained above, is about four times as great as the legally contracted debt service.

In a developing economy such as the Federation's, the expansion of which depends in part on providing European immigrants with the facilities they expect, many recent loans have been spent in improvements that do not stimulate exports directly at all. And so it is to be hoped that they will in turn lead to other investments that will produce exports and substitutes for imports. The crucial test is whether, concurrently with all these new outlays that are financed by nonresidents, the merchandise and service accounts will in time become sufficiently less unfavorable to meet at least interest charges plus the cost of the consumer- and producer-goods imports induced by these exports. It appears that the export rate of return—on all loans from abroad together—needs to be about four times the financial rate of return required by most lenders abroad.

companies. They credit most of their sales proceeds to London bank accounts and remit to the Federation only those funds needed there for payroll, local material purchases, taxes, etc. Dividends and interest are paid from London to security holders most of whom live outside the Federation. When they undertake large investments in the Federation, the capital funds come from outside the local economy. Accordingly, as an approximate adjustment in all tables, the undistributed profits of these companies have been subtracted from reported merchandise exports, and conversely their investments in the Federation have been treated as capital inflows. There are of course many other small countries in which a few companies with large direct investments operate in this manner. In such cases the published balances of payments must be interpreted carefully for the reasons given here. One important consequence is that the local economy is *partially* insulated from fluctuations in the prices of these large companies' exports, even though high copper prices mean increased output, royalties, local taxes, wages and bonuses.

III. *Dependence Upon Continued Capital Inflows*

The Federation, like many another immature creditor country before it, is dependent upon a continued inflow of capital if economic acitivity is to be maintained. Since imports are a leakage from the payments circuit, a high propensity to import makes for a "leaky" economy that requires offsetting injections of merchandise exports and foreign capital.

Moreover, the Rhodesias have lately emerged from a period of frenzied growth often experienced in newly settled areas. The coming of federation, high prices for copper until 1957, and a comparatively high rate of European immigration combined to instigate, and until recently to maintain, a boom in city real estate. The Kariba project, costing £80 million, stimulated both enthusiasm and the economy. Today optimism is less extreme, and people appreciate the vulnerability of the local economy to reductions in export proceeds and loans from abroad.

What capital inflows will be needed during the next few years for per capita incomes to continue at something like their recent levels?[8] Any attempt at an answer must be based on obviously rough estimates and some crude assumptions (see Table 2). First, relying upon the relations recorded in Table 1, necessary gross injections are set at 1.11 (the reciprocal of .9) times the required aggregate personal income.

Second, an estimate of future export proceeds is made (see line 3 of Table 2).[9] Extrapolated export proceeds fall short of necessary gross injections. One part of the difference will have to be net capital inflows. But the other part will be unleaked gross injections of previous years. (See the appendix for definitions and algebra).

It is supposed that the Federation's economy is a circulating monetary system, subject to leakages and injections. The leakages each year are imports—considered to be .75 of gross injections—and external debt service. The gross injections each year are exports, capital inflows from abroad, and unleaked gross investment that remains from the injections of previous years.[10] In other words, it is assumed that old gross

[8] Recent per capita annual incomes have been around £500 for Europeans (including Asiatics) and £12 for Africans, the large difference being partly explained by most of the latter being in the subsistence economy. Allowances should be made for increases in population during the next few years. Aggregate personal income must then be £271 million in 1960, £288 million in 1961, and £299 million in 1962 if per capita incomes for both races are to be maintained.

[9] During 1954 through 1958, exports (less undistributed profits of the copper companies) climbed slowly from £117 million to £135 million. A similar annual percentage rate of physical increase, but with copper at a more normal price of £240 a long ton (as compared with £172 in 1958), would bring such adjusted exports to about £193 million by 1962. These increases may come primarily from a continued shift in production from blister to electrolytic copper; increased acreages, yields and qualities of tobacco; and greater output of asbestos and chrome. In Table 2 projected exports are adjusted by not more than £2 million in any one year so that required long-term capital inflows will be a constant magnitude.

[10] Together, excluding exports, they comprise gross investment (see Section II).

injections continue to circulate each year as induced injections until leaked away, which occurs very rapidly with high import propensities. The new injections each year are exports and capital inflows. Given the annual gross injections estimated as necessary to provide the required aggregate personal income, and given the other various injections and leakages, one can estimate the level of lending from abroad that is needed.

This approach really ignores domestic injections and leakages that are independent of external injections and leakages. The domestically financed part of gross investment, in any one year, is held to be "induced" in the sense that unleaked net injections from the outside world continue to circulate. The Rhodesian economy is so dominated by its external transactions that it seems permissible to disregard any leakage from unspent domestic savings.[11] And as a practical matter most small countries have more and better information regarding their external transactions—and publish a fairly detailed annual balance of payments —than they do regarding domestic saving and domestic autonomous investment. Hence the method of analysis used here may be valid and necessary for small countries deeply involved in the world economy.

Table 2, calculated in this way, suggests that the minimum annual foreign lending is about £65 million (Table 2, line 2).[12] This is about the same as in the past.[13] Despite the assumed growth in exports, at least the past rate of borrowing from abroad still appears necessary, partly because of growing population. Long-term capital inflows of this magnitude, as Table 2 also indicates, would prevent pressure on the short-term account.

These minimum capital inflow requirements are not inconsiderable. After all, £65 million annually in net loans is the equivalent of an entire Kariba project every 15 months; and the fact that corporations, individual investors, and international lending agencies have made loans at almost this rate in the past provides no assurance that they will continue to do so. A halving of this lending rate, according to our assumptions, would occasion a fall in personal income of about one-tenth in even the first year. So it would seem that international lending institutions have a responsibility not to encourage a temporary rate of world lending to a small economy if this lending rate is not likely to be sus-

[11] Or one can assume that they are offset by domestic investment that is "autonomous," in the sense that it is independent of external injections and leakages.

[12] "Minimum" because only formerly contracted interest is excluded from exports, E'.

[13] During 1954 through 1958, the annual net inflow of capital averaged about £56 million, of which £50 million might be termed autonomous (long-term) and £6 million induced (short-term). The balance of gross investment, about £71 million annually, was officially reported to have come from domestic sources. However this is here treated as unleaked injections of previous years (line 4, table 2).

TABLE 2—MINIMUM FOREIGN CAPITAL REQUIREMENTS, COMPATIBLE WITH EXPORT PROJECTIONS, TO MAINTAIN PER CAPITA PERSONAL INCOMES AT RECENT LEVELS THROUGH 1962[a]

(millions of pounds)

	1960	1961	1962
Changes in the Circuit of Payments			
1. Necessary gross injections, I_g	305	319	332
2. Required long-term capital inflows, C	65	65	65
3. Exports, E'	167	181	193
4. Unleaked previous gross injections, J_{t-1}	73	73	74
5. Foreign interest payments, D'_b	2	4	6
6. Foreign debt repayment, D'_b	1	2	3
7. Imports, M	229	239	249
8. Unleaked gross investment, J.	73	74	74
Changes in International Balance of Payments			
9. Merchandise and services	−62	−58	−56
10. Interest paid abroad[b]	− 2	− 4	− 6
11. Current account	−64	−62	−62
12. Long-term capital movement[b]	+64	+63	+62
13. Short-term capital movement	+ 0	− 1	+ 0

Derivations: (See also footnote 19)

(1) See Table footnote
(2) Approximate projection: such that lines (2)+(3)+(4)=(1)
(3) Projection, adjusted (see fn. 9)
(4) Line (8) of year before
(5) £2 million×no. years
(6) £1 million×no. years
(7) .75 of line (1)
(8) Lines (1)−[(5)+(6)+(7)]
(9) Lines (3)−(7)
(10) Minus line (5)
(11) Lines (9)+(10)
(12) Lines (2)−(6)
(13) Minus lines (11)+(12)

[a] The population assumed for 1960 through 1962 in millions is respectively .365, .385 and .405 for Europeans and Asiatics and 7.690, 7.900 and 8.078 for Africans. Per capita incomes are assumed to be £500 and £12 respectively for the entire European and African populations. Necessary gross injections are set at 1.11 times required aggregate personal income.

[b] Excluding payments arising from past borrowings from abroad.

tained. The political effects of sudden deflation may be particularly unfortunate in the case of a multiracial country.

IV. *Native Participation in the Market Economy*

Economic development in a dualistic economy is associated with a slow penetration by the Westerners' market economy into the subsistence economy of the indigenous population. Indeed, in the Federation, one measure of economic development is the extent to which the natives become part of the money and market economy of the Western immigrants and settlers. And another measure is the extent to which the participating natives benefit thereby. In both respects the Rhodesian record over the decades has been remarkable.[14]

[14] Especially when one realizes how recent is "civilization" and that, over much of what is

Traditionally, the African man places a high value on irregular work involving danger and excitement. In peacetime the men have concentrated on hunting game and grazing cattle. Hence the cultivation and grinding of mealies, the fetching of water and wood, in addition of course to cooking, mending, and child-rearing, are the chores of the "weaker sex." Women, as the main providers, still have considerable value, whether as wives to be bought or as daughters to be sold.[15] Almost until the first world war, although the white settlers obtained some native labor, the local population had little need or use for the Europeans.[16]

An important factor in overcoming the barriers between the two cultures and economies has been the natives' strong desire for European goods, partly for their use value, but also as prestige items. The men now want "city" clothes and shoes, hunting knives, flashlights and bicycles. The women want yardage goods, simple cooking utensils and gewgaws. Sugar and soap, matches and cigarettes, and inevitably "soft" drinks, are frequently bought. In the native reserves, and for agricultural workers on European cultivated land, these are among the more important purchases by the African from the money economy.[17]

To purchase these limited items and pay taxes an African must acquire money. If on a native reserve, he will occasionally sell a cow or bag of maize "outside." However, to an increasing extent, some of the men seek work in the towns, down the mines, and on the farms, leaving their wives in the reserves to tend cattle, grow mealies, and raise children. In the towns, unless he has some special skill, the native will earn some rations and about 30 shillings a week; on a European farm he will get less, but have a lodging or be given time to build a hut; but on the copper belt he will cost his employer 20 shillings a work day, which explains the very low labor turnover there.

A growing tendency is for some natives to settle, more or less permanently, in the African townships located near the European cities. In this case the family may move from the reserve, and some sort of municipal housing will usually be rented, if available. The family, without real income from farming, is now entirely dependent on the money economy. To some extent this trend is being accelerated by the increase

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now Southern Rhodesia, the Matabele tribesmen were hunting the Mashona people just over seventy years ago.

[15] The old tribal practice of paying a bride price (*lobola*) was only part of the marriage negotiations; today the price may be paid in cash rather than cattle.

[16] Early railroad construction in Rhodesia could never depend on local native labor.

[17] The native hut can be built in a few days and contains no purchased materials. Beer, until recently the only alcoholic beverage permitted, is home-brewed. A native working for a European gets a ration of mealies, meat, salt, and sometimes nuts and oil.

in the native population on the limited acreage originally set aside as native reserves.

At the time of the last census, in 1956, the "economically active population" in the European market economy was put at 110,000 Europeans, 3,000 Asiatics, and 1,037,000 Africans. In terms of the estimated populations by race, this placed 42 of every 100 Europeans and 14 out of every 100 Africans in the European market economy for purposes of earning income. Considering the high proportion of African children, and the rarity of native women working for a wage, this means that at least one out of three adult male Africans had left the subsistence economy.

The most important industries as employers of African labor were, in descending order, agriculture and forestry, construction, manufacturing, mining and quarrying, commerce and finance, government administrative services, and medical and educational services, these categories accounting for 85 per cent of all African wage-earners.

Additional estimates concerning African participation in the European-market economy of the Federation are given in Table 3. From 1954 to 1958 there has been an increase of 17 per cent in those economically active in the market economy; this compares with an estimated 13 per cent increase in native population. The average income of these participating Africans rose from £65 to £87. This increase, of one-third in four years, is in marked contrast to the almost static per capita return to the European population during the same period. It indicates the extent to which the Federation's economy, despite restrictions on job advancement in most of the European trade unions, is increasingly producing for the African.[18]

Africans now earn, as wages or from small businesses, about £2 for every £3 earned by Europeans and others. As consumers, seldom paying income taxes, the African sector commands goods and services approaching £100 million a year. This purchasing power is gaining Africans practical equality as effectively as legislation can provide it.

V. *Conclusions*

Some economic lessons from Rhodesian experience may be applicable to other underdeveloped areas having sparse and primitive native populations. First, a country that is dependent for economic development on a rapid increase of Western population must invest in all sorts of expensive amenities that only indirectly earn exports. Second, a high rate of induced import leakage sharply increases the export rate of return that the economy as a whole must be able to earn on borrowing from

[18] The estimated per capita annual income obtained by Africans from the European-market economy increased from £9.5 in 1954 to £13 in 1958.

TABLE 3—COMPARATIVE POPULATION, PARTICIPATION AND EARNINGS IN THE EUROPEAN MARKET ECONOMY, BY RACE, 1954–1958

	1954	1955	1956	1957	1958
1. Estimated Population (in thousands)					
a. European, Asian and colored	240	257	281	305	321
b. African	6,630	6,810	6,980	7,140	7,460
2. Estimated Economically Active Persons[a] (in thousands)					
a. European, Asian and colored	105	112	120	128	134
b. African	960	998	1,037	1,079	1,120
3. Wages and Salaries (in million pounds)[b]					
a. European, Asian and colored	91.5	104.0	118.1	125.0	130.4
b. African	54.5	61.6	69.6	79.0	83.9
4. Income from Unincoporated Enterprises (in million pounds)					
a. European, Asian and colored	25.7	25.9	28.8	28.3	28.0
b. African	8.6	9.2	10.4	12.0	13.6
5. Estimated Income per Economically Active Person (in pounds)					
a. European, Asian and colored	1,112	1,151	1,218	1,198	1,179
b. African	66	71	77	85	87
6. Estimated Income per Capita from the European Economy (in pounds)					
a. European, Asian and colored	486	504	522	504	495
b. African	9.5	10.4	11.5	12.8	13.0

[a] Economically active persons are those participating in the European market economy rather than in the native subsistence economy.

[b] Includes wages in kind, such as rations, but not unsold subsistence income now valued at about £70 millions.

Source: Recomputed from data in the federal *Economic Report*, 1957, 1958 and 1959.

abroad, if it is to attract more capital and immigrants. Third, a constant inflow of capital is of great importance to a relatively small economy. Fourth, in a multiracial society, largely dependent on native labor, the indigenous population must increasingly participate in the market economy and benefit from it.

APPENDIX

The following is a more formal statement of the model first described in Section II and further developed in Section III.

The symbols used, all being annual values, are:

E', exports, adjusted as explained in footnote 7;
D, extra debt service, including interest and principal repayment;
M_p, producer goods imports;
M_c, consumer goods imports;
M, imports;
K, gross investment;
I_p, gross injections;

Y_p, aggregate personal income;
L, leakages to the outside from the economy;
J, unleaked previous gross injections;
C, capital funds inflow.
An asterisk indicates a stipulated or required value.

In Section II the relationship of necessary extra gross exports, that is the ratio of E'^* to D_1 was stated to be

$$\frac{1}{1-(a+b)},$$

where a is M_p/I_g (actually .36) and b is M_c/I_g (actually .37). $I_g=E'+K$. M_c is held to be .37 of I_g because Y_p is .9 of I_g and M_c is .41 of Y_p.

In Section III, there is a stipulated presonal income Y_p^*, held to be .9 of the thereby necessary gross injection I_g^*. There are certain leakages, L, and injections, I_g, in each time period. $L=M+D$ and $I_g=E'+K$. But $K=C+J$. And $J=I_{gt-1}-L_{t-1}$, thus $I_{gt}=E'_t+C_t+I_{gt-1}-L_{t-1}$. The value ascribed in this section to $a+b$ is .75 and hence $M=.75I_g$. It is assumed that any unspent domestic saving by some is offset by autonomous domestic investment by others. Given I_g^*, E', D, and the import propensity, the task is to find the necessary capital inflow, C^*.

A MODEL OF PRICE FLEXIBILITY

By JOSEPH V. YANCE*

While the accepted theory of price determination is that of Marshall, in which price is mutually determined by supply and demand, the empirical observations of price behavior that were stimulated by Means' work [7], particularly those of Ruggles [10] seem to show that in fact demand has very little effect on industrial prices. Most price changes can be accounted for by changes in direct costs for labor and materials. Here we expand on this notion and show that there is a delay between cost changes and the corresponding price changes. In particular, we show that a distributed delay describes the data rather well. One interesting feature of the model is that a natural measure of price flexibility emerges which meets important objections to Means' measure.

Furthermore, the model seems to answer some of the everyday questions that arise concerning the pricing process. In 1957-58 prices were continuing to rise even though demand was dropping. This was thought to be rather paradoxical, and yet if there are delays in passing on increased costs, this sort of inflation could very well be the result of cost increases in the business system that take time to work themselves out.

Another practical area to which the model has relevance is the accountant's concern with the effect of various types of inventory evaluation methods on profits, taxes, and so on. For the most part, in accounting texts, prices are assumed to go up at the same time that costs go up, or at the time they are reflected in cost of goods sold, but the present model furnishes a more realistic assumption.

In measuring delays of this type, Chenery and others (cited below) have developed statistical tools. An extension of these methods developed here is to show the consistency of results using time intervals of different length, something that is of interest particularly in using statistical results for simulation or whenever there is a need to change

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from a time interval of one length to another. A second extension is to measure the difference in the delay of the price response to an upward, as opposed to a downward, cost change.

I. *The Model*

We assume that in equilibrium the price of a commodity will be a linear function of the price of raw materials and the wage rate. Furthermore, taking this same linear function of the current cost elements, we can define a hypothetical entity for the present time, the "normal price"

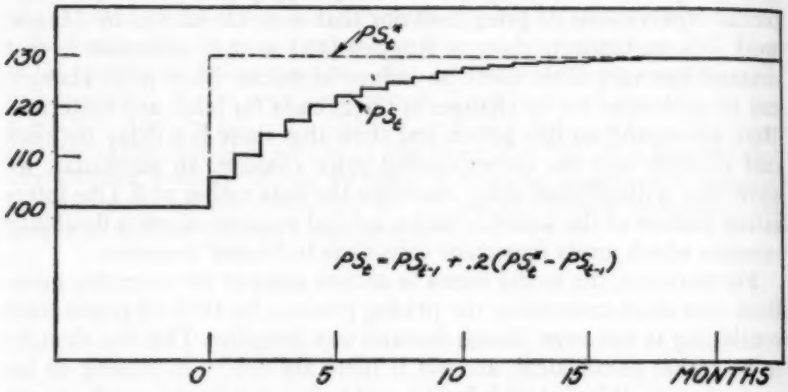

FIGURE 1. RESPONSE OF SHOE PRICES TO STEP INCREASE IN COSTS, PS_t^*

of the commodity. This is the price to which the actual price would tend if the costs remained at their current levels. Thus we define:

$$P_t^* = b_0 + b_1 PR_t + b_2 W_t. \tag{1}$$

P_t^*—current normal or equilibrium price for finished goods.

PR_t—current price of raw materials.

W_t—current wage rate.

In addition, we postulate a mechanism for the way in which an industry changes its price to approach the normal price. The dynamic mechanism proposed here is that the price change this period will make up part of the difference between last period's price and the current normal price, i.e.,

$$P_t = P_{t-1} + a(P_t^* - P_{t-1}) \tag{2}$$

P_t—actual price this period.

This mechanism represents a distributed delay[1] in the sense that if normal price moves from one level to a higher level, the actual price will gradually approach it. An illustration of the response for shoe manufacturing to a hypothetical increase in normal price is shown in Figure 1. The periods are months, and the value of $a = .2$ was obtained in a manner to be described below.

The most awkward question that economists raise about the model is its interpretation in terms of classical theory. The present model obviously makes a host of assumptions relative to classical theory, but the most critical point would seem to be what is assumed to happen at capacity. The model assumes that the margin between price and costs will not change significantly even then, whereas in classical theory price is the equilibrating mechanism and would rise at capacity. In real life I believe that orders are likely to back up and the increased delivery delay serves as an additional, and perhaps more important, equilibrating mechanism than price. In commodity markets we wouldn't expect this to be true; there the margins would be likely to increase as demand increased, but not in manufacturing.[2]

Not only would the pricing behavior implied by the model restrict its applicability to manufacturing as opposed to commodity markets, but the continuity of price changes implied by the model would seem offhand to make it inapplicable to industries like steel and aluminum where prices change rather discretely.

Perhaps the most useful practical implication of the model, in view of the current interest in price behavior, is the measure of price flexibility that emerges. There is only one constant, a. It is obvious that the larger the a, the faster will the model approach the normal price, and therefore a large a implies more flexible prices.

A more specific connection can be shown between the magnitude of a and a measure of price flexibility, however. In terms of the current model, a natural measure of price flexibility is the average delay between a cost change and the price changes that it causes. If we consider a single cost change, part of the resulting price change will occur the first month, a smaller part the next month, and so on. We can calculate the average number of months that the various proportions of the completé price change are delayed. In the Appendix we show that this average delay is:

[1] The mechanism described is the simplest type of distributed delay, an exponential or first-order delay, and has been used to describe a number of economic phenomena: the response of investment to demand (Chenery [2]); the response of dividends to profits (Lintner [5]); and the response of agricultural supply to prices (Nerlove [9]).

[2] In the only study that I know of along these lines, Goris and Koyck [4] examined steel prices to see if margins between costs and price varied with demand, but the study did not reveal any conclusive evidence that they did.

$$\bar{D} = \left(\frac{1}{a} - 1\right) \text{ periods.}$$

For example, with an a of .2, the average delay in the resulting price changes is four months.

In addition, it is a property of this model that even when the cost series to which the model is responding is an actual series, we can pinpoint the effect of a given cost rise and show that the effect occurs with the same average delay.[3] Thus this measure of price flexibility is independent of cost fluctuations, something that is not true of Means' tallies of price changes per unit of time, a shortcoming to which one can logically object.[4]

A second advantage of this measure of price flexibility is that we can meaningfully deal with price indices and average wage rates. The Means-B.L.S. approach is restricted to studying individual commodities, since their measures are not sensitive enough to deal with price indices. And yet what is needed, it would seem, are broad measures for an industry, rather than specific measures for "2 Shoes, childrens, Goodyear, elk or kip upper," "1 Escalator," etc., as in [12].

II. *Application of the Model*

The model has been applied to the U.S. tanning and shoe manufacturing industries. The model seems to explain the price changes rather well, and the results indicate that tanners adjust their prices in response to costs more rapidly than shoe manufacturers do. The average delay in tanning is one month and in shoe manufacturing about four months.

Not only are the lengths of the delays plausible from what is known about pricing in these industries, but the distributed nature of the delays is plausible. Prices do seem to take some time to make a full adjustment, and even though particular manufacturers make discrete price jumps, the aggregate effect is of a more or less continuous response. This is what the model attempts to describe; not the fact that price changes occur after one month or after four months, but that in the aggregrate there is a continuous adjustment which averages one or four months.

The way an individual firm's behavior enters into these aggregate responses is suggested by some other observations. Richard Maffei of M.I.T., in connection with consulting work for a tanner, has observed that when hide prices go up, management gets ready for continued high

[3] This is shown in the Appendix.

[4] It is interesting to note, however, that in spite of the difference between the measures, the conclusions are the same with respect to the greater price flexibility of industries closer to commodity markets (e.g., tanning vs. shoe manufacturing).

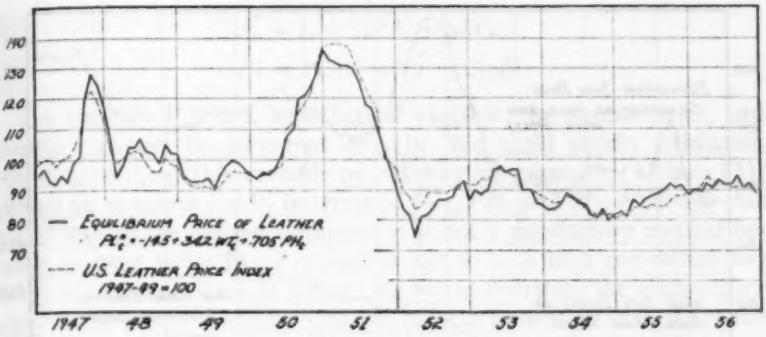

Figure 2. Equilibrium and Actual Leather Prices (Show Effect of Short Delay)

prices over the next few weeks, and if they continue high, will raise leather prices. How long they wait will determine their price flexibility.

A report similar in feeling was published in the *New York Times* [1]:

> Prices of hides have about doubled in the last four months, and the consumer, as a result, can expect higher retail prices for shoes next fall. Several footwear manufacturers have announced price increases of about 8% on fall lines. Some have not raised prices yet, but have indicated that an increase will come unless prices recede.

Another effect of the pricing delays is shown in Figures 2 and 3. A mechanism like this gives a price series that not only is a delayed, but is a smoothed and damped version of the cost series. Furthermore, with a smaller a the price series will be more smoothed and delayed. This is seen by comparing tanning with an $a = .48$ and shoe manufacturing with an a of .19. The solid lines in Figures 2 and 3 are the normal

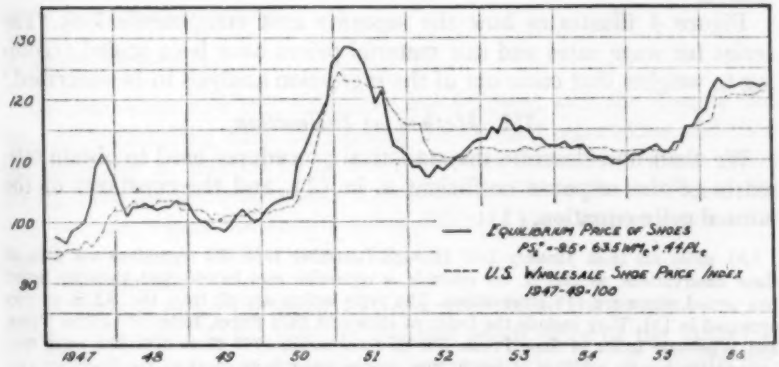

Figure 3. Equilibrium and Actual Shoe Prices (Shows Effect of Long Delay)

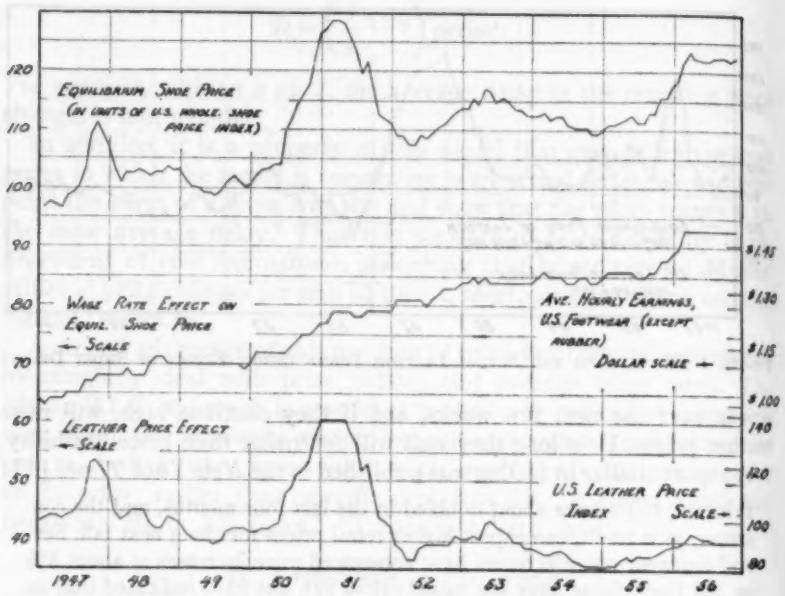

FIGURE 4. EQUILIBRIUM SHOE PRICE AND ITS COMPONENTS, LEATHER PRICE AND WAGE RATE

prices, i.e., the linear combination of costs to which the actual price will tend. It will be seen that for tanning the actual price, the dashed line, though somewhat damped and smoothed, follows its normal price much more than shoe manufacturing follows its. Note that we are illustrating not the goodness of fit of the model—we are not plotting the actual price against model-generated price—but the effect of the various delays.

Figure 4 illustrates how the separate cost components look. The series for wage rates and raw material prices have been scaled according to weights that come out of the regression analysis to be described.[5]

III. *Method of Estimation*

We shall now describe the statistical procedures used to obtain estimates of the response coefficient a, in (2), and the constants of the normal price equation, (1):

[5] All series are from January 1947 through December 1956. All regressions are done on these observations, so that if, for example, a regression uses independent variables lagged one period, there are 119 observations. The price indices are all from the B.L.S. as they appeared in [8]. They include the Index of Hide and Skin Prices, Index of Leather Prices, and Wholesale Index of Shoe Prices. For all three series, 1947–49 = 100. The wage rates are average hourly earnings of production or non-supervisory workers for *Footwear (except rubber)* and *Leather: Tanned, Curried, and Finished*, expressed in dollars, and taken from [11].

$$P_t^* = b_0 + b_1 PR_t + b_2 W_t \tag{1}$$

$$P_t = P_{t-1} + a(P_t^* - P_{t-1}) \tag{2}$$

The variable P_t^* is a hypothetical variable, the normal price, and therefore cannot be measured directly. We could obtain estimation equations without this variable by substituting equation (1) into (2), getting an equation for P_t in terms of P_{t-1}, PR_t and W_t. Although this would lead to the desired estimates, it is not a satisfactory method because, in time series like P_t, there is apt to be a high correlation between successive values of prices; we would overstate the explanatory value of the model. Instead, equation (2) can be written in terms of the change in price, at the same time substituting for P_t^* its value from (1):

$$\begin{aligned} \Delta P_t &= a[(b_0 + b_1 PR_t + b_2 W_t) - P_{t-1}] \\ &= ab_0 + ab_1 PR_t + ab_2 W_t - aP_{t-1} \end{aligned} \tag{3}$$

The term ΔP_t is not necessarily correlated with P_{t-1} so that (3) is a firmer starting point. From equation (3) it is rather obivious how the desired estimates can be made: the coefficient of P_{t-1} gives us an estimate of a; we then divided this into the estimated constant and the other estimated coefficients to obtain estimates of b_0, b_1 and b_2. In addition, from the estimate of a we can calculate the estimate of the average delay.

In discussing the empirical estimates, it should be noted that the measures of goodness of fit which are used are the squares of the multiple correlation coefficient, and secondly that they refer to an explanation of the change in price rather than to the absolute level of price. Since the results are stated in this ultra-conservative way, an R^2 of .50 to .75 is quite satisfactory.

A. *Basic Estimates*

We shall show how this procedure was followed with the tanning and shoe manufacturing data, first giving the original regressions and then the estimates of interest to be inferred from these. It is worth going through the manipulations once in detail to facilitate the reading of the next section, where the results using different time intervals are compared.

In the notation,

PH_t—Price index for hides, i.e., raw material to the tanner.

PL_t—Price index for leather; finished goods price of the tanner in the tanners' price response; raw materials price of manufacturing in its price response.

PS_t—Price index for shoes; finished goods price for shoe manufacturer.

WT_t—Average hourly earnings in tanning.

WM_t—Average hourly earnings in manufacturing.

The orignal regressions are:

(4a) $\Delta PL_t = -7.01 + .340PH_t + 16.5WT_t - .483PL_{t-1}$ $R^2 = .48$, $n = 119$

(4b) $\Delta PS_t = -1.76 + .081PL_t + 11.7WM_t - .186PS_{t-1}$ $R^2 = .41$, $n = 119$

The response parameters are the coefficients of the lagged price; for tanning,

$$a = .483,$$

and for shoe manufacturing,

$$a = .186.$$

Therefore the average delays are, respectively,

$$\overline{DT} = \left(\frac{1}{.483} - 1\right) = 1.07 \text{ months}$$

$$\overline{DM} = \left(\frac{1}{.186} - 1\right) = 4.38 \text{ months}$$

These are the results referred to above, an average delay of about one month in tanning and four months in manfacturing.

The three terms to the right of the equality sign in (4a) and (4b) represent the normal price equation multiplied by the response parameter. So the normal prices are:

(5a) $$PL_t^* = \frac{1}{.483}[-7.01 + .340PH_t + 16.5WT_t]$$
$$= -14.5 + .70PH_t + 34.2WT_t$$

(5b) $$PS_t^* = \frac{1}{.186}[-1.76 + .081PL_t + 11.7WM_t]$$
$$= -9.46 + .436PL_t + 62.9WM_t$$

To get some appreciation of the magnitudes, note that the wage rates are in terms of dollars and are in the region of one to two dollars. The price indices are in the region of 100. A graphical example of the results is presented below.

B. *Estimates with Various Time Intervals*

Among the more interesting aspects of the present work, at least from the standpoint of technique, are the results obtained using different time intervals. Which time interval to use has long been a matter of concern to model builders, one of the early discussions being Lundberg's treatment of "the question of the 'right' period" [6, p. 47]; but it seems now to be regarded as less a philosophical and more an operational question. In simulating models of the present type, J. W. Forrester, in his work at M.I.T., has obtained satisfactory results with time periods of different length, making an approximation that amounts to the same thing as saying that interest compounded semiannually at 2 per cent for half a year is approximately the same as interest compounded annually at 4 per cent a year.

Something similar was done in connection with the present estimation. In the econometric work on exponential delays, this question has never seemed to come up; but it did so in the present case and because the initial R^2's were not as good as might be expected it seemed that the trouble might be that the delay, particularly for shoe manufacturing, was rather long, relative to the monthly intervals of the data. When longer data intervals were tried not only did the model give a better fit, but the results using different periods were amazingly consistent.[6]

The procedure used was to average the data over two- or three-month periods. These are not moving averages; the periods are nonoverlapping. One period is January-February, the next March-April, and so on. The time subscripts in the model than refer to these data intervals. For one-month intervals ΔP_t refers to the change in price from January to February; for two-month intervals it refers to the change from January-February to March-April, and so on for the other variables. For tanning we used an interval of two months, in addition to the initial study based on a monthly interval; and for shoe manufacturing results were obtained for two-month and for three-month intervals.

The consistency between the results using different time intervals was tested by going back to the implications of the formal model and seeing first whether the implied average delays were invariant. When the data intervals vary, the response parameters should vary. If, for example, an industry made a ¼ of the adjustment toward the normal price in one month, it should make a greater proportion of the adjustment when time is measured in units of two or three months. In Tables 1b and 2b, this is seen to be the case. But do the average delays, calculated in

[6] The suggestion came from Sidney Alexander, who had done work which showed that the change in wheat prices from week to week appears to be nonautocorrelated, but changes over longer periods do show persistence in trends.

the way specified above, remain invariant? By and large they do, particularly for shoe manufacturing; for tanning, the estimates are 1.07 and .86 months, and for manufacturing 4.38, 4.13, and 3.78 months.

A more striking illustration of the usefulness of the formal model in demonstrating consistency shows up when the coefficients of the other variables are compared. In the original regressions, the coefficients change quite a bit with different data intervals. For example, the successive coefficients for WM_t are 11.7, 21.1, and 28.4 (Table 2a) for one-, two-, and three-month intervals. However, they *should* change because by hypothesis these coefficients represent the product of a constant from the normal price equation and the response parameter. The important question is, do the normal price equations remain invariant; and we find that they do. These are shown in Table 1c and 2c. We find, for example, that the estimates of the coefficients of WM_t in the normal price equations are 62.9, 63.5, and 64.

TABLE 1—SUMMARY OF RESULTS FOR TANNING

a. Original Regressions

Data Interval					
1 mo.	$\Delta PL_t = -7.01 + .340PH_t + 16.5WT_t - .483PL_{t-1}$				$R^2 = .48$
	(3.42)	(.034)	(2.19)	(.048)	$n = 119$
2 mo.	$\Delta PL_t = -12.94 + .503PH_t + 25.2WT_t - .701PL_t$				$R^2 = .77$
	(5.33)	(.039)	(2.93)	(.054)	$n = 59$

b. Estimates of Average Delay

Data Interval	Parameter a	Average Delay, in Months
1 mo.	.483	$\left(\frac{1}{.483} - 1\right) = 1.07$
2 mo.	.701	$\left(\frac{1}{.701} - 1\right)2 = .86$

c. Estimates of Normal Price

1 mo. $PL_t^* = \frac{1}{.483}[-7.01 + .340PH_t + 16.5WT_t] = -14.5 + .70PH_t + 34.2WT_t$

2 mo. $PL_t^* = \frac{1}{.701}[-12.94 + .503PH_t + 25.2WT_t] = -18.5 + .72PH_t + 36.0WT_t$

Not only are the results consistent, but with longer time intervals the R^2's improve considerably, going from .4 or .5 for the one-month intervals to .7 or .8 for the longer intervals. There appears to be a bias

TABLE 2—SUMMARY OF RESULTS FOR SHOE MANUFACTURING

a. Original Regressions

Data Interval					
1 mo.	$\Delta PS_t = -1.76 + .081PL_t + 11.7WM_t - .186PS_{t-1}$				$R^2 = .41$
	(1.17)	(.0093)	(1.62)	(.027)	$n = 119$
2 mo.	$\Delta PS_t = -3.50 + .147PL_t + 21.1WM_t - .332PS_{t-1}$				$R^2 = .61$
	(2.36)	(.016)	(2.86)	(.043)	$n = 59$
3 mo.	$\Delta PS_t = -5.17 + .198PL_t + 28.4WM_t - .443PS_{t-1}$				$R^2 = .75$
	(3.52)	(.021)	(3.75)	(.056)	$n = 39$

b. Estimates of Average Delay

Data Interval	Parameter a	Average Delay, in Months
1 mo.	.186	$\left(\frac{1}{.186} - 1\right) = 4.38$
2 mo.	.332	$\left(\frac{1}{.332} - 1\right)2 = 4.03$
3 mo.	.443	$\left(\frac{1}{.443} - 1\right)3 = 3.78$

c. Estimates of Normal Price

Data Interval	
1 mo.	$PS_t^* = \frac{1}{.186}[-1.76 + .081PL_t + 11.7WM_t] = -9.46 + .436PL_t + 62.9WM_t$
2 mo.	$PS_t^* = \frac{1}{.332}[-3.50 + .147PL_t + 21.1WM_t] = -10.5 + .443PL_t + 63.5WM_t$
3 mo.	$PS_t^* = \frac{1}{.443}[-5.17 + .198PL_t + 28.4WM_t] = -11.7 + .447PL_t + 64WM_t$

in the results, in that as we extend the length of the interval, we underestimate the average delay so that the time intervals can not be increased indefinitely; but the general improvement in fit is so marked that one wonders what property of the data could account for it.

C. *Autocorrelation of Residuals*

The residuals turn out to be autocorrelated in general—except for the shoe manufacturing run using a three-month data interval. The autocorrelation may represent, in part, the effect of demand on profit margins; with strong demand, firms can get a higher markup over

direct costs or pass on cost increases faster. These demand effects are likely to persist from one month to the next, as shown in the simulation covering the Korean period presented below.

The Durbin-Watson measures of autocorrelation are shown in Table 3. If the measure is below the $d_L - d_U$ band of uncertainty there is certain autocorrelation (at the 95 per cent level); above the band there is no autocorrelation (at the 95 per cent level).

TABLE 3—AUTOCORRELATION MEASURES: SHOE MANUFACTURING AND TANNING
(Number of independent variables $= k' = 3$)

	Autocorrelation Measure (d)	Number of Observations (n)	Uncertainty Range (5 Per Cent Level) d_L	d_U
	Shoe Manufacturing:			
1 mo.	1.19	119	1.61	1.74
2 mo.	1.26	59	1.48	1.69
3 mo.	1.83	39	1.33	1.66
	Tanning:			
1 mo.	1.07	119	1.61	1.74
2 mo.	.99	59	1.48	1.69

D. *Illustration of Model-Generated Prices*

An example of the results generated by the model is given in Figure 5. The solid line is the target that actual prices are assumed to be following, the normal shoe price. The dashed line shows the price that we would get with a distributed delay as given by the model—the way this was calculated will be described presently. The model-generated prices are seen to be fairly close to the actual prices, except when the price of leather and wages began to rise rapidly after the Korean outbreak; the price of shoes rose father then than the model would have predicted. This is probably the result of the sellers' market which then existed; it illustrates how the model may furnish a starting point for measuring the effect of demand on manufacturers' margins. Then, as leather prices fell and rose again in 1952, we see that the delay mechanism accounts very well for the fact that there was a negligible swing in shoe prices.

The data used for the graph are two-month averages. The method used for calculating the model-generated prices was a simulation, rather than an attempt to reproduce the data that went into the regression. The difference hinges on whether, in getting our model-generated prices of shoes, we use the actual lagged price (of shoes), as is common in most such graphs, or the lagged model-generated price, as used here.

The main stimulus to the model is the normal shoe price, calculated as a linear function of the price of leather and the wages of shoeworkers. To obtain a model-generated shoe price for the first period, January-February, 1950, we use in equation (2) the normal price for this period and the actual shoe price for November-December 1949. For the next model-generated price, we use the normal price for March-April and the model-generated shoe price for January-February. In terms of electrical mechanisms, the normal price is the independent input to the system and the actual November-December 1949 shoe price is the initial condition for shoe prices. This simulation method of generating shoe prices seems to show the behavior of the model more clearly than the standard method of presentation, particularly when the interest is in reproducing actual behavior rather than in prediction.

E. *Test for Phase Differences*

One of the interesting possibilities with behavior of this type is that there may be different responses up or down. Myron Gordon has conjectured that, broadly speaking, in a competitive effort to keep the good will of customers, firms would tend to pass on raw material cost increases slowly and decreases in costs rapidly. Similar phase differences have been proposed for investment or dividend behavior [5], and, in fact, Lintner argues that his dividend model shows a propensity to be more sluggish on the downswing. His model does not have the effect

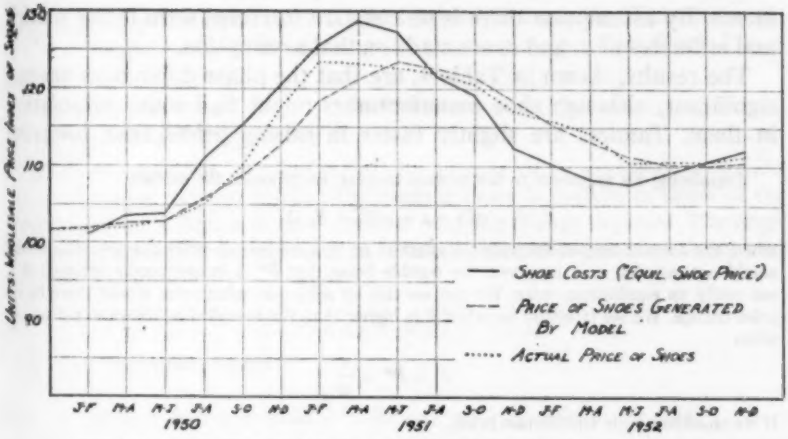

FIGURE 5. COMPARISON OF ACTUAL AND MODEL-GENERATED PRICE BEHAVIOR OF SHOE MANUFACTURERS

claimed, however;[7] so there may be some point in discussing the method used here for testing phase differences, even though the conclusion is that differences are negligible.

The basic model for this situation is one in which there are two response parameters: a_1, which holds if the difference between normal and lagged price is positive; and a_2, which holds if it is negative, which may formally be described as in Table 4. To make estimates of a_1 and a_2, we first used the estimates of the normal price equation presented earlier to calculate the time series $(PL_t^* - PL_{t-1})$. We treat this difference as making up two time series, one of positive differences and one

TABLE 4—TWO-PHASE PRICE RESPONSE ESTIMATES, BOTH INDUSTRIES
In both cases: $\delta=1$ if $(P_t^*-P_{t-1})\geqq 0$; $\delta=0$ if $(P_t^*-P_{t-1})<0$.

Tanning:		
1 mo.	$\Delta PL_t = \underset{(.07)}{.54}(\delta)(PL_t^*-PL_{t-1}) + \underset{(.06)}{.44}(1-\delta)(PL_t^*-PL_{t-1})$	$R^2=.49$
Shoe Manufacturing:		
2 mo.	$\Delta PS_t = \underset{(.036)}{.295}(\delta)(PS_t^*-PS_{t-1}) + \underset{(.083)}{.356}(1-\delta)(PS_t^*-PS_{t-1})$	$R^2=.60$

of negative differences; for a given month we have an observation of one or the other but not both. Making such a regression is almost like making two separate regressions, except that the multiple regression coefficient R^2 includes the combined explanatory value of both elements. By assumption there is no constant intercept term in the model, and estimates of a_1 and a_2 are made on that assumption.

The results, shown in Table 4, are that the phase differences are not significant, although shoe manufacturers might find some consolation in them. Tanners are slightly faster in raising prices than lowering

[7] Translating his argument to the present context, he proposes the model:

$$\Delta P_t = c + a(P_t^* - P_{t-1})$$

where the c could supposedly have the effect of an upward bias on price changes. The model would not act that way however, the trouble being that P^* is inconsistently defined; it is not really an equilibrium price. We can see this by asking at what price would there be no price change. We see it would be when P is higher than the so-called equilibrium price; i.e., when

$$P = P^* + \frac{c}{a}.$$

If we redefine a truly equilibrium price,

$$P_t^{*\prime} = P_t^* + \frac{c}{a},$$

the price behavior is seen to be completely symmetrical around it,

$$\Delta P_t = a(P_t^{*\prime} - P_{t-1}).$$

them, and conversely for shoe manufacturers. The response parameters are close to those estimated previously, and the R^2's are about the same.

IV. *Summary*

We have explored the suggestion that many or most of the price changes that occur are due to changes in the direct labor and material costs. We have assumed that there is a delay between a change in costs and a change in prices, that this delay is not a fixed interval, but is distributed over time, and we have proposed a model in which this distribution over time is assumed to be of a specific form. The model is consistent with the view of many economists that it is primarily increases in costs that push up prices. Under such a view, we would expect, for example, that if steel wages go up, steel prices will go up.

But the model does more than restate the cost-push view because in its detailed mechanism, the delay in raising prices can account for another aspect of recent inflation trends, that prices have continued to rise even though demand has slackened and wages have stopped rising. If a sequence of industries has delayed price responses, it will take some time for an initial price rise to work its way through the system. It is a property of distributed delays of this type that if two or more are put in a sequence, the average delay of the final price in the chain in its response to the initial cost increase is the sum of the average delays of the individual industries. Thus with a pricing delay of one month in tanning and four months in shoe manufacturing, the retailer will face increases in prices with an average delay of five months. This, interestingly enough, is the order of magnitude given in the *New York Times* story.

Appendix

I. *Derivation of Average Delay*

Here we show the calculation for the average delay assuming a step increase in costs (normal price). The average delay is derived in terms of the delay between a change in costs and the resulting change in prices. The original model can easily be expressed in terms of changes in prices and costs; the original equation is:

$$P_t = P_{t-1} + a(P_t^* - P_{t-1}).$$

Taking a difference, we get:

$$\Delta P_t = \Delta P_{t-1} + a(\Delta P_t^* - \Delta P_{t-1}) = (1 - a)\Delta P_{t-1} + a\Delta P_t^*.$$

We can now calculate the price response. With a step increase in P_t^* in period 0,

$$\Delta P_t^* = P_t^* - P_{t-1}^* = \overline{P} \quad \text{for} \quad t = 0$$
$$= 0 \quad \text{for} \quad t > 0.$$

By the equation above, the price change is:

$$\Delta P_0 = a\overline{P},$$

$$\Delta P_1 = a(1-a)\overline{P},$$

and so on, as shown in Table 5, column 3.

The delay between the initial cost rise and each segment of the price rise is shown in column 4. To calculate the average delay, we multiply, for each period, the price rise times the delay, sum the products over the period, and divide by the sum of the price rises (the sum of column 3):

$$\overline{D} = \frac{0a\overline{P} + a(1-a)\overline{P} + 2a(1-a)^2\overline{P} + \cdots}{a\overline{P} + a(1-a)\overline{P} + a(1-a)^2\overline{P} + \cdots}$$

TABLE 5—RESPONSE TO A STEP INCREASE IN COSTS

Period	(1) P_t^* (normal price)	(2) ΔP_t^*	(3) ΔP_t	(4) Delay between ΔP_0^* and ΔP_t
-1	0	0	0	
0	$\overline{P}$	$\overline{P}$	$a\overline{P}$	0
1	$\overline{P}$	0	$a(1-a)\overline{P}$	1
2	$\overline{P}$	0	$a(1-a)^2\overline{P}$	2
.				
.				
.				
t	$\overline{P}$	0	$a(1-a)^t\overline{P}$	t
Sum		$\overline{P}$	$\overline{P}$	

To evaluate this, we first show that the denominator adds up to $\overline{P}$; it is the property of the model that if the normal price increases, the actual price will eventually reach the normal price. The denominator

$$= a\overline{P}[1 + (1-a) + (1-a)^2 + \cdots] = \frac{a\overline{P}}{1-(1-a)} = \overline{P}$$

Hence the expression for $\overline{D}$ reduces to:

$$\overline{D} = a(1-a)[1 + 2(1-a) + 3(1-a)^2 + \cdots].$$

Letting $r = (1-a)$, we see that the term inside the bracket is the derivative of a geometric series, $1/(1-r)$. I.e.,

$$\frac{d}{dr}\left[\frac{1}{(1-r)}\right] = \frac{d}{dr}[1 + r + r^2 + \cdots] = 1 + 2r + 3r^2 + \cdots$$

and

$$\frac{d}{dr}\left[\frac{1}{(1-r)}\right] = \frac{1}{(1-r)^2}.$$

Finally, therefore,

$$\overline{D} = a(1-a)\left[\frac{1}{[1-(1-a)]^2}\right] = \frac{1-a}{a} = \frac{1}{a} - 1$$

which was to be proven.

It might be mentioned that we get this average delay because we assume that a cost increase has an effect on prices during the first period of the cost increase. If we had stated the model in such a way that the first effect on prices occurred the period after the cost increase, the whole price response would be shifted down one period and the average delay would be $1/a$, that is, with the model

$$P_t = P_{t-1} + a(P^*_{t-1} - P_{t-1}).$$

Another point is that in some cases we use data intervals of two or three months. The same mathematical argument holds as above, except that for the case of two-month intervals, the first response comes with a delay of zero, the second with a delay of one period, or two months, etc. Hence, to convert the above expression in terms of intervals into terms of months, we multiply by the number of months per interval. Let

Δt = length of data interval, in months per interval. Then:

$$\overline{D} = \left(\frac{1}{a} - 1\right)\Delta t \text{ months}$$

II. *Superposition*

In the text it was pointed out that the derivation of the average delay using the case of a step increase in the normal price was not in any way a limitation on the result. This can be shown by expanding the equation above:

$$\Delta P_t = \Delta P_{t-1} + a(\Delta P^*_t - \Delta P_{t-1})$$

to get, for the general case, the change in price in terms of previous cost changes:

$$\Delta P_t = a\Delta P^*_t + a(1-a)\Delta P^*_{t-1} + a(1-a)^2\Delta P^*_{t-2} + \cdots$$

Any change in cost will have the same effect in this equation as it had in the special case of the step increase in costs. In the first period a change in costs of $\overline{P}$ will add the term $a\overline{P}$ to the change in prices; in the next period it will add a term $a(1-a)\overline{P}$ to the change in prices, and so on. So even though all the past history of cost changes is relevant to the price changes in a given month, we can, in the model, isolate the effect of a given cost change on later price changes, and the average delay in the effect of these components will be the same as that which we have calculated above.

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THE ALLOCATION OF JOINT COSTS WITH DEMANDS AS PROBABILITY DISTRIBUTIONS

By A. A. WALTERS*

The development of the theory of the single-product firm has been very rapid over the past thirty years. But the elaboration of this theory to include multiple-product firms has made little progress since the famous Pigou-Taussig controversy in 1912–1913 [3]. Since most of the firms dealt with by the applied economist produce a number of commodities or services, he has much difficulty in applying the theory to the data (see, for example [1, p. 339]). One particularly acute difficulty arises from the allocation of joint costs. Theory suggests that we calculate the marginal cost of each product separately by holding the quantity of others constant while we increase the production of one product by a single unit. To find the most profitable mix of products we need to equate marginal cost and marginal revenue for each product.[1] There is no "allocation of joint costs" involved directly in this procedure; it has all been taken into account in calculating marginal cost.

To estimate costs we need to know how total costs change as outputs change. Now it is extremely rare that the cost investigator finds enough observations of outputs and total cost to enable him to estimate the relationship between total cost and the various levels of output. Indeed the number of parameters to be estimated for a two-product firm is usually at least twice as many as that for a single-product firm. To get good estimates of the parameters there must be a large number of firms each producing a different proportion of products. But in fact it is unlikely that there will be much variation in the output mix of a cross-section of firms. If each firm has similar technology, the same prices of output, labor and raw materials, there will be little difference in the product proportions.

These difficulties have led practical economists to try to estimate marginal cost more directly. Instead of trying to trace variations in total cost, they have attempted to determine directly the increase in costs that would occur if output of one commodity were expanded by one unit and production of other commodities remained constant. The accounts of a particular firm or of a number of firms are analyzed to find

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[1] Some of the difficulties in this procedure are discussed by P. J. D. Wiles [6, p. 98 et seq.].

what items of expenditure would be increased if output of one commodity was increased.[2] One may find in the accounts, or construct from technological relationships, those subcategories of costs which are connected with the commodity (or service) in question. These costs cause little difficulty. There are, however, always other items of cost which are joint and connected with the output of more than one product. Thus the costs of a round trip of a truck are joint costs incurred to provide both outgoing and incoming freight services. The degree of jointness of the costs varies from the case in which there are rigidly fixed proportions (which more or less corresponds to the trucking case) to that in which the proportions of the product are highly variable (as in oil refining).

Now the allocation of joint costs between the various products is obviously the main problem in this sort of analysis. Cost accountants customarily divide up joint costs according to which outputs "caused" the joint costs. If there are rigid proportions, the economist proclaims that this allocation is irrational. Many examples of this appear in the transportation industries. The truck completes a round trip from A to B and back again to A. Ignoring the cost of loading and unloading the vehicle, this approximates to a case of rigid proportions (x tons capacity out and x tons back); and it is urged that the costs of the round trip cannot be allocated, and indeed need not be allocated, to find profit-maximizing outputs. Marginal cost varies erratically; it is either the cost of the round trip or zero. The economist is correct when the quantity demanded can be controlled *with certainty*. Allocations of joint costs are irrational. But where the quantity demanded cannot be controlled with certainty, when it is subject to chance fluctuations, we must define a new operational concept—marginal expected costs. This value takes into account these chance variations.

We shall argue that, even in the case of rigid proportions, marginal expected costs do not vary erratically as output varies, and that we get smooth marginal expected cost series. The conditions under which this is true are: (1) where demands are in the form of a joint probability distribution for a given price; (2) the product is impossibly expensive to store; (3) the price is fixed at the beginning of the marketing period and is held throughout the whole period; (4) all demand is satisfied; and (5) excess output can be disposed of without cost. Under these conditions,[3] it is rational to "allocate" joint costs for the purpose of profit maximization. Hence the allocations of accountants and traffic

[2] This is the method of "costing" used by the Interstate Commerce Commission. For a more recent and more sophisticated version of the method, see [2].

[3] These assumptions were used in Walters [4] [5].

costing officers may often have a rational economic basis. Indeed it is shown that the figures presented by cost accountants will usually be better than those of the economist.

I. *Expected Demand and Expected Cost*

Before we attempt to deal with the multiproduct firm, it will be useful to set out the theory of the *single*-product firm when demand is subject to random variations. We can then elaborate the method easily to include the multiproduct firm. The single-product firm considered here fixes its price at the beginning of the marketing period and finds it impossibly expensive or very detrimental to goodwill to change price during that period. These conditions correspond to those of the transport industries. Stories of "Dutch auctions" and "horse bargaining" are occasionally told, but they seem to be exceptional. Given the price, the quantity demanded is not a *certain* figure, but varies from day to day. The businessman does not know the quantity which will be demanded on any specific day; but we do assume that he knows the *probability* of any quantity being demanded.

There is no single demand curve in this situation since, for any given price, the quantity demanded is a probability distribution. With a given price, the businessman can attach a probability or likelihood to the various quantities of output he may sell during the marketing period. However, we can conceive of a simple stable relationship between the price and the *expected* quantity demanded. As price is reduced the expected demand is increased. To simplify, we shall suppose that the probability distribution of output does not change as price changes except that the mean of the distribution moves in the opposite direction to price. Thus if the output is denoted by X, the probability distribution for a given price p_i is denoted by $f(X|\, p_i)$. We denote the expected quantity of output, the sum of outputs weighted by the probabilities, for a given price by $\overline{X}(p)$. Thus: $E\{Xf(X|\, p)\} = \overline{X}(p)$. We have in fact assumed that $f\{X-\overline{X}(p_i)|\, P_i\} = f\{X-\overline{X}(p_j)|\, P_j\}$ for any i and j. This means that, in particular, the dispersion remains constant as mean output increases. For the transport industries this is certainly unrealistic for large increments of traffic. But this assumption does simplify the analysis and so it will be retained throughout most of this paper.

The assumption that the output of the firm is impossibly expensive to store is not really crucial for the following results. It is retained in order to avoid going into problems of inventory costs, etc. On the other hand, the assumption that all demand must be satisfied at the going price is rather more important. The firm must somehow produce during the market clearing period the quantity demanded—however costly such

production may be. There are many possible variations of this assumption; for example, if the firm were unable to produce the full amount, the firm may buy goods or services from other firms to sell to its own customers. Circumstances such as these could easily be incorporated. The assumption that excess output can be disposed of without cost is only absolutely necessary for the rigid proportions case.

The probability distribution of the demands for the outputs of a *two*-product firm is given by: $f\{X_1, X_2 | \overline{X}_1(p), \overline{X}_2(p')\}$. The subscripts denote the two products and p and p' are the respective prices. In other words, we specify that the entrepreneur fixes the two prices—p for the price of product 1 and p' for the price of product 2. The *expected* or mean outputs demanded $\overline{X}_1(p)$ and $\overline{X}_2(p')$ are given once the prices are specified. The actual quantities demanded X_1 and X_2 are grouped around these expected outputs and the probability of X_1 of product 1 and X_2 of product 2 being required is denoted by $f\{X_1, X_2 | \overline{X}_1(p), \overline{X}_2(p')\}$—the joint probability distribution. Again we assume that the probability distribution does not change as prices vary, except that the mean outputs change thus:

$$f\{X_1 - \overline{X}_1(p_i), X_2 - \overline{X}_2(p_i') \mid p_i, p_i'\} = f\{X_1 - \overline{X}_1(p_j), X_2 - \overline{X}_2(p_j) \mid p_j, p_i\}$$

for any i, j. That is to say the probability of outputs deviating from expected outputs by given amounts does not change as mean outputs change in response to variations in prices. There is no need to assume that the demands are not related, i.e., that an increase in X_1 does not change the demand schedule for X_2, although the process of profit maximization is much simpler when this assumption is made.

The relationship between the market clearing period, i.e., the period in which demand must be satisfied, and the conventional short period should be specified. In the freight transport industries the market clearing period is perhaps less, but not very much less, than the short period. If the market clearing period were less than the short period, we should have to develop market-clearing-period cost curves. This would require a complicated and tedious description of the relation between the market-clearing-period cost curve and the ordinary short-run curve. To avoid all this we shall assume in the following analysis that the market clearing period is *equal* to the short period. This simplifies the development.

We want to find the prices which will maximize the profits of the firm. In the ordinary deterministic theory of the firm output is produced such that marginal revenue is equal to marginal cost for each output. With a probabilistic demand the concept of marginal cost is replaced by marginal *expected* costs. This is defined for output X, as the difference

between expected costs with expected output $\overline{X}_1+1$ units and expected costs with expected output $\overline{X}_1$ units when, in both situations, the quantity $\overline{X}_2$ is held constant.

In order to develop this more formally, we must calculate expected costs. If $C(X_1, X_2)$ is the cost function, we define expected costs as:

$$E\{C(X_1, X_2) \mid \overline{X}_1, \overline{X}_2\} = \int_0^\infty \int_0^\infty f\{X_1, X_2 \mid \overline{X}_1, \overline{X}_2\} C(X_1, X_2) dX_1 dX_2.$$

This expectation is for *given* expected outputs of $\overline{X}_1$, $\overline{X}_2$; that is to say, for given prices p and p'. Now consider the consequences of a small reduction in the price of the first commodity so that the expected output increases from $\overline{X}_1$ to $\overline{X}_1+h$. The difference between the expected costs (divided by h) when expected output is $\overline{X}_1+h$ and when it is $\overline{X}_1$, is defined as the marginal expected cost of X_1, or MEC_{X_1}. This is the relevant short-run cost which the entrepreneur takes into account when he considers reducing or increasing the price. Now it follows that:

$$MEC_{X_1} = \int_0^\infty \int_0^\infty C(X_1, X_2) \cdot \left\{ \frac{f(X_1, X_2 \mid \overline{X}_1 + h, \overline{X}_2) - f(X_1, X_2 \mid \overline{X}_1, \overline{X}_2)}{h} \right\} dX_1 dX_2$$

$$MEC_{X_1} = \int_0^\infty \int_0^\infty C(X_1, X_2) \frac{\partial f}{\partial \overline{X}_1} dX_1 dX_2. \tag{1}$$

In other words, the cost corresponding to a given output combination is weighted by the changes in the probability of that combination as mean output increases; the products are then summed over all output mixtures to give MEC_{X_1}.

II. *A Simple Joint-Cost Case*

The simplest version of the joint-cost case is where the two outputs are provided by one process of production resulting in fixed proportions. The trucking industry corresponds quite closely to this model. The cost of a round trip of a 14-ton capacity vehicle results in 14 tons capacity from A to B and the same on the return trip from B to A. The round-trip costs depend then on the larger of the two tonnages carried. The simplest cost function for this joint cost, assuming perfect divisibility, is then:

$$C = \alpha X_1; \qquad X_1 > X_2.$$
$$C = \beta X_2; \qquad X_2 > X_1. \tag{2}$$

This joint-cost function could then be embedded in the total-cost function.

We can demonstrate some results graphically and get some insight into the allocation of joint costs by proceeding rather less formally. Let us represent the outputs X_1 and X_2 on the axes of the following diagram and draw the constant cost curves for each combination of X_1 and X_2. Let us suppose that $\alpha=\beta$, i.e., the increase in cost due to a unit increase in X_1 when $X_1>X_2$ is exactly the same as the increment in cost for a unit increase in X_2 when $X_2>X_1$. The constant cost curves are then represented by bBb', $d'Dd$, etc., where $Ob=Ob', Od=Od'$, etc., and the total cost is simply proportional to the ordinates Ob, Od, etc.

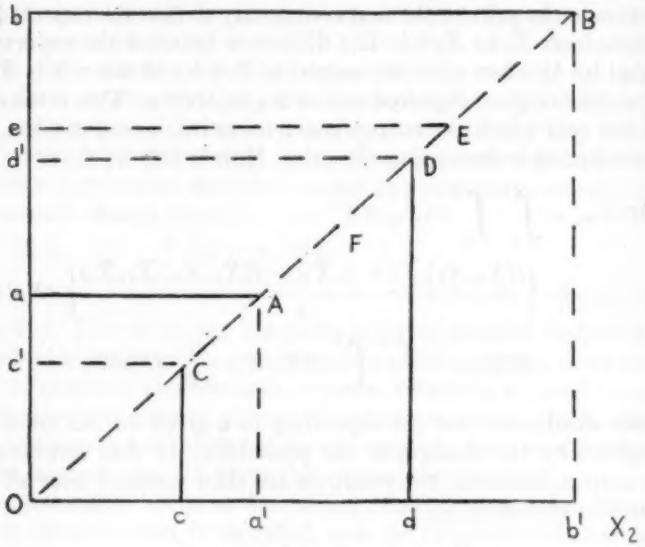

FIGURE 1

Now suppose that the demand for X_1 takes *only* two values, a and b, and that the demand for X_2 assumes only the two values c and d, given the prices of the two services. Further suppose that combinations of these demand quantities are equiprobable; thus the probability of (a of X_1 and c of X_2) is equal to $\frac{1}{4}$ which is the same as the probability of (b of X_1 and c of X_2), i.e., $P(a, c)=P(a, d)=P(b, c)=P(b, d)=\frac{1}{4}$. The output which must be produced for these demand combinations is simply the larger of the two values. Thus in the case of a of X_1 and c of X_2, the production point is represented by A when Oa of X_1 is sold, Oc of X_2 is sold and ca' is thrown away. The point C cannot be a production point since the quantity of X_1 required is at least Oa. The point B is a production point both when the combination (b, d) and (b, c) are

required, so the probability of having to produce at B is $\frac{1}{4}+\frac{1}{4}=\frac{1}{2}$. The probability of having to produce at points A and D is of course $\frac{1}{4}$ each. To find expected costs we need to weight the total cost at production points A, D and B by the proportions $\frac{1}{4}$, $\frac{1}{4}$, and $\frac{1}{2}$ respectively. This can be done geometrically by bisecting the line between A and D at say F, then bisecting the line between F and B giving the point E. The value e on the X_1 (or X_2) axis then gives expected costs by multiplying by the cost per unit (i.e. α).

Now consider a small increment (h) in both a and b while c and d remain constant. The effect on expected costs is clearly to increase it by:

$$\alpha h(\tfrac{1}{4} + \tfrac{1}{2}) = \tfrac{3}{4}\alpha h.$$

Marginal expected costs are then equal to $\frac{3}{4}\alpha$.[4] If $a<c$ such that the order of the points on the 45° line is $ACDB$, an increase of h in a and b would affect expected costs only through the point B. In fact if $a<c$, production will never take place at point A. Clearly marginal expected costs are then $\frac{1}{2}$. Two extreme cases can also be considered. First suppose that $a>d$, that is to say, A and B are moved up the 45° line until A is above D. Then clearly the marginal expected cost of X_1 is α. Secondly, suppose that the $c>b$; that is to say, the order of points on the diagonal from left to right is $ABCD$. In this case, marginal expected cost of X_1 is zero. With this simplest of all joint probability distributions, there are therefore four possible marginal expected costs of X:[5]

MEC		Order of Points on 45° Line
$=0$	if $c>b$	*ABCD*
$=\frac{1}{4}\alpha$	if $a<c$	*ACDB*
$=\frac{3}{4}\alpha$	if $a>c$	*CADB*
$=\alpha$	if $a>d$	*CDAB*

This is, of course, a considerable generalization of the case with certain outputs where there are only two marginal costs, zero and α.

Instead of supposing that the demand for X_1 consists of *either* a or b, we can generalize the results by assuming that X_1 takes values continuously *between* a and b. Similarly, we assume that X_2 takes values continuously between c and d. The simplest continuous distribution is

[4] Certain changes in the dispersion of the joint probability distribution do not affect the value of marginal expected costs. If, for example, c were increased but were still less than a, we should get the same figure.

[5] There are 4! possible unrestricted orderings of points $ABCD$ along the diagonal and 6 orderings where $A<B$ and $C<D$. But three of these are isomorphisms of the other three, just as the last value in the table is an isomorphism of the first.

that in which the probability of each output combination over specified ranges of X_1 and X_2 is constant. If the range of X_1 is a to b, and the range of X_2 is c to d, then the marginal expected cost is given by:[6]

$$(3) \qquad MEC_{X_1} = \frac{\alpha}{2(d-c)}[a+b-2c]$$

provided that $b-a<d-c$ and $a>c$.

Secondly, when $a<c$ and $b<d$, we get:

$$(4) \qquad MEC_{X_1} = \frac{(b-c)^2}{2(b-a)(d-c)}.$$

Thirdly, when $a<c$ and $b<d$, the formula is:

$$(5) \qquad MEC_{X_1} = \frac{\alpha}{(b-a)(d-c)}\left[b(d+c)+ac-\frac{a^2+d^2}{2}\right].$$

Let us examine first the special case where the level of back-haul traffic is much less predictable than the amount of outgoing traffic (X_1). To carry it to an extreme, let us suppose that $a=b$, i.e., the outgoing traffic is one certain volume. Clearly equation (3) is then applicable and:

$$(6) \qquad MEC_{X_1} = \frac{\alpha}{2(d-c)}2(a-c) = \alpha\frac{(a-c)}{(d-c)}.$$

The marginal expected cost curve corresponding to this formula is shown in Figure 2. MEC_{X_1} is zero up to $\overline{X}_1=c$, then it rises with slope $\alpha/d-c$ to α at $\overline{X}_1=d$.

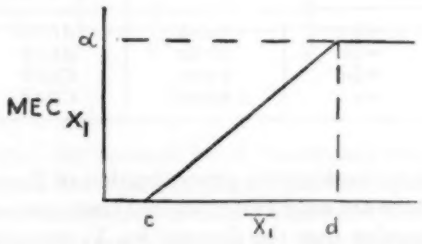

FIGURE 2

The next case we examine is where the mean of X_1 is equal to the mean of X_2 and $a=c$, $b=d$. All three of the above formulae (3), (4) and (5) give:

$$(7) \qquad MEC_{X_1} = \frac{\alpha}{2}.$$

[6] See appendix for proof.

This says that the marginal expected cost of X_1 is equal to one half the joint costs. Now this is just the allocation which would be suggested by a cost accountant in these circumstances. Most economists would object to this allocation as being both irrational and undesirable because they would have in mind *certain* outputs, not probability distributions. And with this cost function, marginal cost with certainty (*MCC*) is either zero or α, according to whether $X_1 < X_2$ or $X_2 < X_1$. The allocation rule of the accountant is much more relevant to the decisions made by the firm.

Unfortunately, it is only a coincidence that the accountant's procedure coincides exactly with the optimum economic allocation. Many varieties of apportionment conventions are employed by accountants. Probably the most common approach would be to allocate joint costs in proportion to the expected traffic flows. Thus the accountant would allocate

$$\frac{\overline{X}_1}{\overline{X}_1 + \overline{X}_2}$$

of the incremental cost to output 1 and the remainder to output 2. The average burden of joint cost per unit of output would be the same. If the accountant employed this rule, he would get the same results as equation (3) only when the mean outputs and the limits were the same.

If we write the ratio of the means as λ, i.e.

$$\lambda = \frac{\overline{X}_2}{\overline{X}_1} = \frac{c+d}{a+b}$$

we can show that the accounting rule will underestimate the joint-cost element in marginal expected cost when $\lambda > 1$ and when $a > c$ (i.e., the lower limit of X_2 is less than the lower limit of X_1); when $\lambda < 1$ and $a < c$ and $b < d$, then the accountant will overestimate the joint-cost allocation. The accountant's figures will in any case lie between the MEC_{X_1} and the marginal cost with certainty (*MCC*) of $\overline{X}_1$ (with $\overline{X}_2$ as the certain output of commodity 2).[7] This curious result implies that the calculations of the cost accountants are nearer to the relevant figure than those of a naive economist who regards average outputs as a quantity to be produced each period and who ignores the random variations.

These results only apply to the special case of the probability distributions considered above. This is perhaps the most simple probability distribution one may postulate. Other more realistic distributions of the humped type would give somewhat different results. However, the conclusions do not differ in any fundamental way from those which we have

[7] See appendix for proof.

found for the joint rectangular distribution. MEC_{X_1} will still fall between the two extreme values zero and α or zero and β. The biases involved in the cost accountant's allocation rules will, however, depend on the parameters of the probability distribution and, because we have to deal with truncated distributions, this is normally a complicated function. The marginal enlightenment is hardly worth the additional algebra involved. On the other hand, it is relatively easy to develop the cost function a little more realistically, such as:

$$C = \alpha_1 X_1 + \alpha_2 X_2; \qquad X_1 > X_2$$

and

$$C = \beta_2 X_2 + \beta_1 X_1; \qquad X_1 < X_2$$

where α_1 and β_2 are large compared with α_2 and β_1. This would involve a little more elaboration of the above formula but the results would be basically similar.

A study of the cost of traffic sent by British Road Services vehicles originally stimulated the development of this analysis. The particular vehicle trips between Birmingham and Wales and the southwest of England were examined in some detail to find the technical make-up of each of the services to the different destinations. The method used was to measure the vehicle time spent, the input of loading dock labor, etc., on each of the services. The inputs were then valued to find the total variable cost of the round trip, out from Birmingham to the southwest and back again from the southwest to Birmingham.

The round-trip vehicle cost from Birmingham to Bristol was approximately 23 shillings per ton. There were only fragmentary data on the probability distribution of the traffic, and those data were not inconsistent with the rectangular distribution (i.e., equiprobable combinations of outgoing and incoming tonnages). The following were the estimates of the parameters of the distribution:

$$a = 1430 \qquad b = 2010$$
$$c = 1350 \qquad d = 1650$$

Then, using formula (5):

$$MEC = 23\left[\frac{b(d-c) + ac - \dfrac{d^2 + a^2}{2}}{(d-c)(b-a)}\right]$$
$$= 18.4 \text{ shillings approximately.}$$

This compares with a cost accounting allocation of about 12.5 shillings; so there is a considerable difference.[8]

[8] This cost study was included in a report submitted to the Ministry of Transport. The research was financed by Counterpart Funds (Conditional Aid).

III. *Concluding Remarks*

This paper has argued that in many industries where joint costs are important, the demand is not certain but has the form of a probability distribution. In the case of fixed proportions, the allocation of joint cost is both rational and necessary in order to find profit-maximizing price and output. With rectangular probability distributions, a rule, used quite commonly by cost accountants, estimates marginal expected cost *exactly* when the two outputs have the same expected value. But in general, the accountants' rule will produce biased results—overestimating when the mean of X_1 is lower than the mean of X_2, and underestimating when $\overline{X}_2 < \overline{X}_1$. The application of the simple model to the cost study of British Road Services vehicles gave results which were quite different from those of the accounting allocation. The example shows how the economist may help accountants to improve their allocations, rather than condemn them as irrational.

Appendix

1. To calculate *MEC* from first principles when:

$$C = \alpha X_1 \qquad X_1 > X_2$$

$$C = \alpha X_2 \qquad X_2 > X_1$$

and

$$f(X_1, X_2) = \frac{1}{(b-a)(d-c)} = \frac{1}{k} \quad \text{where} \quad 0 < a < X_1 < b,$$

and

$$0 < c < X_2 < d.$$

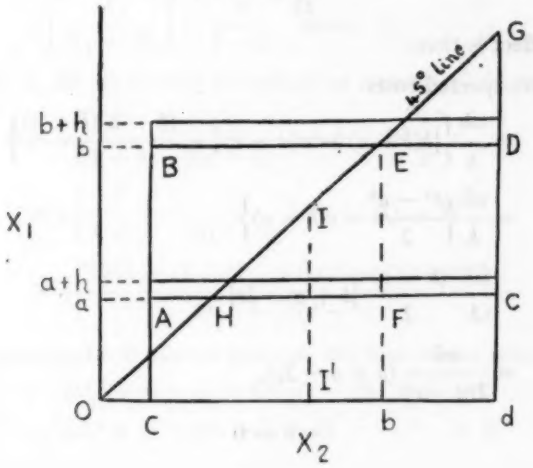

Figure 3

In Figure 3, we show the distribution of X_1 and X_2 for the case where $b-a<d-c$ and $a>c$. Each point on the rectangle bounded by a, b, c, and d is equiprobable.

We wish to find the increase in expected costs as a increases to $a+h$ and b to $b+h$. Expected costs are reduced by the rectangle represented by a to $a+h$ over the same range of X_2. The increment in expected costs can be split into two parts by the diagonal at E as shown on the diagram. Similarly, the decrease in expected costs can be split in the same way at H.

The net increase in expected costs due to the increase in the limits BE from b to $b+h$ and AH from a to $a+h$ is:

$$\frac{\alpha h}{k}\left[b(b-c)-a(a-c)\right].$$

The increase in ED from b to $b+h$ increases expected costs by

$$\frac{\alpha h}{k}(d-b)\left(b+\frac{d-b}{2}\right)$$

and the decrease caused by HC increasing to $a+h$ is given by

$$\frac{\alpha h}{k}(d-a)\left(a+\frac{d-a}{2}\right).$$

The net result of these last two elements can be represented diagrammatically as the decrease in expected costs:

$$\frac{\alpha h}{k}\left[HF\times II'\right]=\frac{\alpha h}{k}\left[(b-a)\left(a+\frac{b-a}{2}\right)\right]$$

$$=\frac{\alpha h}{2k}(b-a)(b+a).$$

The total effect is then:

Change in expected costs

$$\doteq\frac{\alpha h}{k}\left\{\left[b(b-c)-a(a-c)\right]-\frac{(b-a)(b+a)}{2}\right\}$$

$$\doteq\frac{\alpha h}{k}\left\{\frac{b^2-a^2}{2}-c(b-a)\right\}$$

$$\doteq\frac{\alpha h}{k}\,\frac{(b-a)}{2}\left[b+a-2c\right]$$

$$\doteq\frac{\alpha h}{2(d-c)}(b+a-2c).$$

And as $h\to 0$

(i) $$MEC_{X_1} = \frac{\alpha}{2(d-c)}[a+b-2c].$$

Next consider the case when $a \leq c$ and $b \leq d$. By an argument similar to that above we get:

(ii) $$MEC_{X_1} = \frac{\alpha}{k}\left[b(b-c) + (d-b)\left(b + \frac{d-b}{2}\right) - (d-c)\left(c + \frac{d-c}{2}\right)\right]$$

$$= \frac{\alpha(b-c)^2}{2(b-a)(d-c)}.$$

Next consider the case were $a \geq c$ and $b \geq d$, then:

(iii) $$MEC_{X_1} = \frac{\alpha}{k}\left[b(d-c) - a(a-c) - (d-a)\left(a + \frac{d-a}{2}\right)\right]$$

$$= \frac{\alpha}{(b-a)(d-c)}\left[b(d-c) + ac - \frac{a^2+d^2}{2}\right].$$

In the special case where $a=c$ and $b=d$, all the formulae (i), (ii), (iii) reduce to:

$$MEC_{X_1} = \frac{\alpha}{2}.$$

2. An accounting allocation according to average tonnage is:

$$\alpha\left[\frac{\overline{X}_1}{\overline{X}_1 + \overline{X}_2}\right] = \frac{\alpha}{1+\lambda} \quad \text{where} \quad \lambda = \frac{c+d}{a+b}.$$

The bias (B) in the accounting allocation for formula (i) is given by:

$$B = \alpha\left[\frac{1}{1+\lambda} - \frac{1}{2(d-c)}(a+b-2c)\right]$$

$$= \alpha\left[\frac{1}{1+\lambda} - \frac{1}{2\lambda(d-c)}\{c(1-2\lambda)+d\}\right]$$

$$= \alpha\left[\frac{2\lambda(d-c) - (1-\lambda)\{c(1-2\lambda)+d\}}{2\lambda(1+\lambda)(d-c)}\right].$$

Since the denominator is always positive, the bias is zero when:

i.e., $$2\lambda(d-c) - (1+\lambda)\{c(1-2\lambda)+d\} = 0$$

$$2c\lambda^2 + (d-c)\lambda - (c+d) = 0$$

so that

$$\lambda = \frac{c - d \pm \sqrt{(d-c)^2 + 8c(c+d)}}{4c}.$$

But since $c-d$ is always negative, only the positive value under the square-root sign is of interest.

$$\lambda = \frac{c - d \pm \sqrt{d^2 + 9c^2 + 6cd}}{4c}.$$

$$= \frac{c - d + (d + 3c)}{4c}$$

$$\underline{\underline{\lambda = 1}}.$$

This means that only when $a=c$ and $d=b$ is the accounting allocation unbiased. This is the case where $MEC_{x_1}=\alpha/2$. Otherwise, the bias is negative.

Similar formulae can be worked out corresponding to (ii) and (iii) above, but they are rather more complicated.

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COMMUNICATIONS

Availability of Foreign Language Books in Economics

Few members of the American Economic Association apparently know that they can now easily borrow most recent foreign language books in economics. The Farmington Plan, a cooperative agreement established over ten years ago, made arrangements for American libraries to divide among themselves the obligation to import "at least one copy of each new foreign book and pamphlet that might reasonably be expected to be of interest to a research worker in the United States" [1, p. 3]. The books on economic theory procured under the Farmington Plan are in the library of the University of Chicago and those in all other branches of economics are mainly in the library of New York University. They can be readily obtained through interlibrary loans. The following classes of material are not among those obtainable: periodicals, numbered serials, dissertations, government documents, and the publications of Russia and her satellites or of Japan.

Before the inauguration of the Farmington Plan we depended on the somewhat hit-and-miss procedures of our research libraries for acquisitions of this kind. The systematic purchases in the overseas markets undertaken by the Farmington agents during the last decade have probably doubled the number of different books that otherwise would have been bought. The plan provides a further service by requiring that everything received be quickly recorded in the National Union Catalog at the Library of Congress, so that anybody can determine from an inquiry addressed to that library the correct location of a desired book. The plan obligates the institution having the books to make them available.

The founders of the Farmington Plan hoped that it would help American students to enlarge their acquaintance of the literature of other countries. Unfortunately no increased internationalization appears to have taken place in the area of economics. The writings of contemporary foreign economists have arrived in abundance, they are cataloged and ready to be studied; yet they stand on the shelves unread and unexamined. Sufficient direct testimony to their disuse comes from the librarians who look after the collections. An issue-by-issue inspection of the footnotes in the *American Economic Review* since 1948 will confirm their reports. Except for studies of the economies of particular nations (Russia principally) or those by economists from abroad, the number of articles that contain non-English references is small. To those who might think that foreign literature can be disregarded with some safety it may be pointed out that book reviewers praise the new foreign books generously. For instance, the September 1959 issue of the *American Economic Review* contains sixteen reviews of books in foreign languages (more than one-quarter of the total) which almost always commend the volumes and often describe them as "contributions," but has no article with so much as a single foreign-language allusion.

Even a wide knowledge of the greater accessibility of books and pamphlets provided by the Farmington Plan will not, by itself, broaden spectacularly our familiarity with foreign economics. For the linguistic barricade has prevented communication and it is not visibly falling in response to the many voices (and large amounts of federal money) which, in these days, call attention to the advisability of considering ideas originating outside our own language boundaries. Whatever aid the Farmington Plan books can give, however, is so easily within reach and so inexpensive in time and energy to utilize that it is a pity that it is overlooked.

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A Regional Countermeasure to National Wage Standardization

Economists have, almost without exception, discussed policy questions from the point of view of national governments. Political reality indicates that even within a single government's over-all policy program internally conflicting and offsetting measures are often encountered. Even more likely is it that, when two or more independently organized and overlapping governmental units enact economic policy measures simultaneously over the domain of the same economy, the separate governmental units may have sharply conflicting policy objectives as well as different constitutionally determined powers of action. In political federalism, conflicts between the national government and the state or regional government units seem certain to occur. In such a political setting, the economist's tools may be quite helpful in suggesting ways and means through which a separate governmental unit may take action to offset or negate the effects of policy measures taken by an overlapping jurisdiction. The possibility that action taken by the separate states may serve to offset national government policy which is contrary to the interest of the national economy, has not been adequately considered. This paper attempts to examine a particular case of this sort.

We assume a closed economy extending over a wide geographical area. The economic order is competitive, and the legal structure includes institutions which effectively enforce competitive norms except where specific exemption is granted. The national government also enforces the employment of a common currency unit throughout the economy. Suppose now that the national government imposes a legal minimum wage, higher than the lowest wage that would otherwise prevail. This wage is standardized for the whole economy and its coverage extends over a significant number of the employed workers, but not over all workers. No account is taken of differing labor-market conditions in the separate regions. We also assume specifically that there is a national policy of exempting labor organizations from the legal sanctions against restraint of trade. Labor organizations are encouraged to bargain collectively to obtain favorable wage contracts. These contracts are assumed to include standardized

wage rates for similar jobs in different geographic regions of the economy.

Within this single national economy there are a number of regional governmental units possessing residual political powers. These states are prohibited by the Constitution from interfering directly with the flow of resources, goods, and services across state boundary lines. The states retain financial independence. They are empowered to tax individuals directly and indirectly to secure revenue for the performance of independent governmental functions or to provide transfers.

The states are classified into two groups the difference between which is defined in terms of the ratios of the productive factors. The orgins of these differences in factor ratios need not concern us; they may be due to historical development, a different natural resource base, or to any other reason. The first group contains large amounts of unskilled and semiskilled labor relative to capital and skilled labor. The second group contains large amounts of capital and skilled labor relative to unskilled and semiskilled labor. We shall call the first group the "labor-surplus" states, and the second group the "capital-surplus" states, although the relative nature of the surplus in each case should be kept clearly in mind.

In this setting, it is clear that the effects of the two specific national policy measures mentioned, standardized minimum wages and standardized union-enforced wage rates, will cause real wages in covered industries in the labor-surplus states to be too high from the point of view of the usual market criteria for maximum efficiency. If the minimum wage is at all effective, some qualified workers in the labor-surplus states will not be able to find employment at the wage rates prevailing in the industries covered by the legislation. These workers will be forced to remain unemployed or to find employment in those occupational and industrial groupings not covered by either standardized wage contracts or minimum wage restrictions; or, perhaps more realistically, these workers will be forced to remain employed ("underemployed") in the uncovered areas of the regional economy. It follows that wages in the occupations and industries not covered by either the minimum wage legislation or by standardized union contracts will be lower than those that would prevail in the absence of the national policy measures outlined.

Workers unable to find employment in the covered or standardized industries in the labor-surplus states will find it advantageous to migrate to the capital-surplus states to the extent that labor can be absorbed there. Since the policies discussed are national in scope, the employers in covered industries in the capital-surplus states cannot hire workers below the nationally set wage levels. Migration of capital and skilled labor from the capital-surplus to the labor-surplus states will also take place to some extent, but this migration may be impeded by the wage standardization policies.

We now seek specifically to answer the question: Is there any action that the individual states may take which will effectively offset the central government policy of enforced wage standardization? It is evident that only the labor-surplus states will be directly interested in such action.

If offsetting action by the individual labor-surplus state is to be effective, it must result in a lowering of real labor costs for the unskilled and semiskilled

categories in those industries covered by the standardization, where the relative surplus is assumed to exist. We propose a policy of state taxation of employees' wages coupled with the subsidization of all employers in proportion to their wage bills. This policy measure seems clearly to fall within the limits of state constitutional powers as outlined in the policy model. The tax would be generally imposed on all payrolls; it would not be discriminatory. The proceeds would be returned directly to employers of labor in proportion to their total payrolls.

The policy proposal suggested is deceptively simple, so much so that some further analysis of its effects seems warranted. The employer would be authorized to deduct the proportional state tax from the paychecks of the individual wage and salary earners. What would be the incidence of this tax? It is necessary here to distinguish quite sharply between those categories of labor which are in "surplus" and those which are "scarce." In our model, we have assumed that the labor-surplus areas are characterized by a relatively large number of unskilled and semiskilled laborers, but by a relatively small number of skilled workers. For the surplus laborers employed in covered or standardized industries, the tax would fall squarely on the wage earner. Because of the large supply of labor that is able and willing to work at the standardized wage rate, even after payment of the tax, the employer would not find it necessary to increase wages or salaries to offset the tax. The effect of the tax will clearly be to reduce labor costs to the covered industry employer for those categories of labor in surplus. In the case of the labor that is scarce, however, the tax-subsidy scheme will immediately cause employers to bid up the prices of these laborers. The tax will quickly be passed along to the employers who also receive the offsetting subsidy. On these groups, therefore, the tax-subsidy plan is fully neutralizing. There will be no incentive provided for those members of the labor force which are in the greatest demand to migrate to the capital-surplus states because of the fiscal action.[1]

In the uncovered industries, wages are assumed to be determined competitively prior to any action. The result of the tax-subsidy scheme will be to increase the demand for labor in the covered occupations, leading to the transfer of labor from the uncovered to the covered industries where labor productivity is greater. If universally applied as this model assumes, the tax-subsidy plan would produce a full equalization of wage levels for comparable quality labor-

[1] If we assume that the supply of the scarce labor (skilled labor in our model) is fixed, the effects of the tax-subsidy scheme can be easily traced. The effect of the subsidy is to shift the demand curve for this category of labor upward so that the price increases by the full amount of the tax. This, of course, is a first approximation. To the extent that skilled laborers are substitutes for unskilled and semiskilled laborers in production in the relevant industries, skilled labor's wages will rise by less than the full amount of the tax. To the extent that the opposite or complementary relationship holds, skilled labor's wage rate will be increased by more than the tax.

This assumption as to the supply curve of the scarce labor may be contrasted with that of the surplus labor. In the latter case, our model assumes that the supply curve is horizontal at the going wage level. Thus, the subsidy-induced shifting in the demand curve has the effect of increasing employment without increasing wage rates. The incidence of the tax must remain with the wage earners.

ers in the covered and the uncovered industries. For laborers remaining in the uncovered industries, the net result of the proposed measure would be an increase in real wages after taxes. For society as a whole, the shifting of economic resources from less productive to more productive employments would clearly increase over-all efficiency, as this is normally measured.

Before the policy action, the primary burden of attaining some ultimate resource equilibrium necessarily rests on migration. After the action, there will be less incentive for those who are underemployed in the surplus-labor states to migrate to the capital-surplus states. Some semiskilled and unskilled workers employed in covered industries before the tax might be induced to migrate to the capital-surplus region to escape tax liability. However, by stimulating the inflow of capital investment into the labor-surplus states the proposed measure would, in the long run, tend to reduce the postulated difference in labor incomes between the two regions.

One of the most interesting features of the simple proposal of wage-bill subsidization from gross payroll taxes is its self-correcting or neutralizing aspects. As implied already in the analysis of the scarce labor sector above, the proposal cannot interfere with the "efficient" working of the market mechanism. It can only correct "inefficiencies," which it does by acting as a substitute for wage flexibility. This feature insures that the proposal could not become a means whereby interstate competition could reduce national real income, as measured by efficiency criteria.

A capital-surplus state, where, by assumption, both unskilled and semiskilled labor are scarce, can never compete with the labor-surplus states by enacting the same policy measures. For, as we have seen, when the resource is scarce, the effects of the tax and the subsidy are completely neutralizing and nothing could be gained from implementing such measures. There is no federal government policy to be negated here.[2] By the same reasoning, once the relative labor surplus is eliminated in those states which we have called labor-surplus states, the policy ceases to be effective.

It must, of course, be recognized that the policy proposal presented here does not represent the best of all possible worlds for residents of the labor-surplus states. Broadly speaking, the effects of the policy outlined are similar to those that would result from a change in national policy which produces competition in the labor markets. State off-setting policy must be within the realm of the second-best, but it is important to recognize that it does provide a substitute for national policy changes with respect to minimum wage restrictions and union wage standardization.

Alternative policy measures taken at the state level may also be developed to deal with substantially the same problem. For instance, a policy which might generate more political support in the labor-surplus states would be one which extends the subsidies to only new enterprises. Many variants on policies of this sort are to be found in the real-world attempts of governmental units to

[2] If in fact national government policy should include the fixing of rates of return to non-labor resource units the analysis presented here is fully applicable. For example, a national minimum land rental policy could be offset by the "land-surplus" states.

attract new industry. Given the national policy as fact, there are many possibilities for independent action by smaller political units. These are worthy of further exploration and research.

JAMES M. BUCHANAN AND
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Population and Economic Growth: Comment

1. It is unfortunate that our current propensity to build models requires us to offer simple explanations of complex phenomena. E. E. Hagen's hypothesis that birth rates depend on death rates but that "birth rate and size of family calculus . . . is imbedded in unconscious motives relating to sex and family inculcated in children during their first six years" (p. 319) seems to me an obvious oversimplification.[1] Various objections are possible but in my judgment the most important is that the hypothesis ignores the fact that many children are "unwanted" in the particular sense that they would not be born if birth control or abortion were readily available.[2]

Recent Japanese experience provides remarkable evidence of the extent to which children may in this sense be "unwanted." Currently, between 40 and 60 per cent of all pregnancies (depending on the number of unreported abortions) are being terminated by abortion, which is both legal and financed by the national health insurance program. As pregnancy rates have not declined significantly, it seems clear that the drop in the Japanese birth rate from 34.3 in 1947 to 17.2 in 1957 can only be attributed to the legalization and widespread utilization of abortion.

Developments in Japan obviously cannot be explained by Hagen's hypothesis. If decisions regarding family size were in fact inculcated in children during their first six years, then the number reaching child-bearing age in a decade could explain a halving of the birth rate only if new mothers had been inculcated to want no children whatsoever—in this case during the height of Japanese militarism!

But it is not the technical inadequacy but the inadequacy of the policy implications of Hagen's hypothesis that I want to stress. If one took his hypothesis literally, birth rates could only be lowered by reducing death rates and then waiting a generation for changing subconscious inculcations to reduce birth rates. Actually, even if we accept his formulation for "wanted" children, so long as "unwanted" children are being born birth rates can be lowered as rapidly as birth control or abortion can be made available. Perhaps the proportion of "unwanted" pregnancies in Japan is higher than it will be found to be in other areas. But no one (so far as I know) foresaw a halving of the Japanese birth rate in a decade. It seems quite likely that, without any change in the inculcations distinguished by Hagen, drastic declines in birth rates in

[1] Population and Economic Growth," *Am. Econ. Rev.*, June 1959, *49*, 310-27.

[2] Obviously this is only one of many possible meanings of "unwanted."

many areas could result if ready availability of birth control or abortion made it possible to eliminate "unwanted" children.

2. I take it that Hagen offers his hypothesis regarding inculcations before six in an effort to explain the observed lag between the fall in death and birth rates. I very much doubt whether a satisfactory explanation of the lag is possible unless the availability of birth control and abortion is brought into the picture—though this will *not* provide a full explanation and in fact is itself in need of ultimate explanation. I shall cite only three bits of evidence. The birth rate first declined among those with higher income, who obviously were among the first with access to birth control information. Secondly, the great reduction in the differential between the birth rates of those with high and low incomes that has recently taken place coincides with evidence from a recent sample survey that 90 per cent of fertile white married couples now use some form of birth control. And, thirdly, the fact that very large families—five children and over—have declined all through the sharp postwar rise in birth rates appears only capable of explanation in terms of increasing availability of birth control.

3. It seems unfair to Malthus to suggest that his model implies that the "birth rate is not influenced by the level of income" (p. 322). Surely Malthus would not have denied the impact of income on birth rates under conditions such as presently prevail in Japan. If he reached a different conclusion, it was only because he was prepared to allow income—or anything else—to influence birth rates only by encouraging continence or postponing marriage. With the possible exception of postponed marriage in Ireland, is there any evidence that, if these are the only acceptable techniques, he was wrong?

4. Hagen suggests that birth rates are likely to fall to a level close to that of death rates, yielding a "fairly low" positive rate of increase varying between .5 and 1.3 per cent per year. He quotes Notestein to the effect that "Western Europe and the English-speaking countries" are tending toward a birth rate "15 per cent above the secular minimum" with "the conspicuous exception of five countries" where the rate is considerably higher (p. 324). I wish Hagen had devoted more time to a discussion of the probable future behavior of birth rates. Keep in mind that what he brands "exceptions" include perhaps four-fifths of all English-speaking people and perhaps 40 per cent of the total population in question.[3] Particularly if we continue to have enough illegitimate children to provide infertile couples with two or three children via adoption, an average three-child family involves substantial population growth and an average four-child family very rapid growth. It seems to me that, for a considerable period, the private benefits of having a third or even a fourth child are likely to exceed the private cost. Further, if Hagen's expectations regarding technological progress are realized, it seems likely that the rate of population growth of the "exceptions," where income is higher and expanding more rapidly than in the rest of the area, may well come to be the "rule" for the entire area. In short, there seems no certainty that in the future the rate of increase of developed areas will be "fairly low." Nor do I see any reason for

[3] I have taken "Western Europe" to mean non-iron-curtain Europe excluding Greece and Yugoslavia.

expecting an increase in the private cost of having children until long after the social problems raised by continuing population growth have become acute.

5. I gather that while Hagen is inclined to deplore the extent to which our increasing productivity is being devoted to the production of children, he is not worried even for "the very long run"—partly because of his faith in technological progress and partly because he is not bothered by the prospect that 99.9 per cent of our population may in the future be living elsewhere than on earth. I think it is important to be clear on the magnitude and timing of the problem technology will have to solve. Let us conservatively assume that the population of the United States grows in the future at no more than a 1.3 per cent rate (the top of Hagen's range). I doubt if I would get widespread support for a proposal to invite the entire present world population to come live in the United States. At a 1.3 per cent rate of increase the same result will be achieved by 2170. If thereafter we wish to continue to increase at the same rate without adding to numbers on earth, we will have to put 30 million Americans a year into permanent orbit.

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Population and Economic Growth: Reply

For brevity, I shall not reply in detail to each of Professor Villard's points. I agree with many of his statements, but I view his facts in a perspective different from his.

1. I agree that my model would correspond to reality more fully if availability of birth control had been included as a variable. The Japanese case is a highly pertinent one. Still further, the differential desires of men and of women are pertinent, and the psychic costs of birth control methods might well be analyzed separately from their impact on births. If a method of birth control at low psychic and economic cost were readily available to women, I do not doubt that the lag between decline in death rates and that in birth rates would be greatly reduced. However, the model would be greatly complicated by such considerations.

The facts that the rate of population declined in the United Kingdom after 1869-1879, in France after 1855-1865, and in Russia after 1870-1885 are not, I suspect, explained by increasing availability of birth control, and the persistence today of high population growth rates in many countries where death rates were cut sharply ten or fifteen years ago indicates that birth control is not apt to spread rapidly everywhere today. Hence I think that the simpler model is of analytical importance.

Moreover, I do think that psychological attitudes, as distinguished from availability of birth control methods, are very important. But there is no point in arguing this further here. I regret that I did not discuss the possible influence of birth control textually.

2. I suggest that the early declines in rates of population growth cited above do indicate that Malthus' assumption was not highly realistic.

3. Long-run world population prospects run counter to my value judgments as well as to Villard's. In future generations green spaces may become scarce, and human structures may completely cover rivers and lakes; and a person may yet be able to drive from New York to London, past industrial enterprises and juke boxes. The problem is one of private versus public costs, but not merely that. According to the values of the majority of people, living standards may still be rising. I, in turn, am repelled at the prospect; but I see no reason to forecast a return to physiological subsistence levels. The magnitude of the problem technological progress will have to solve is no greater than that of the problem it has solved in the past.

Let me take this opportunity to clarify a statement in my article which has puzzled more than one reader. In my Figures 1 and 2, each v function reflects "a constant function relating saving (S) to income" (p. 317). This does not imply a constant ratio of saving to income at different income levels, but only an unshifting function. Further, the v function is a long-run one; in most circumstances one would not expect movement along it over time; rather, movement to the right or left and movement to a higher or lower function would occur together.

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The Shape of the Income Distribution: Comment

Theoretical doubts have seldom dissuaded students of the income size distribution from seeking that ideal function or even that empirical "law" which will fit income-size statistics of all times and all places. But there is serious cause for dispute when, apart from all theoretical argument, the empirical fit of such a function turns out to be poor.

In an article in the June 1959 issue,[1] Stanley Lebergott suggests that a symmetrical curve, in particular the normal curve of error, is at the heart of the income-size distribution. Lebergott argues that the relevant U.S. income distribution shows less skewness than we are accustomed to think and that such skewness as does exist can be attributed to "credit rationing" to the self-employed. Thus, citing *Current Population Reports* statistics for a population of males, age 25-64, he finds that the income distribution is "remarkably like the normal gaussian, remarkably unlike the usual skewed distribution" (p. 344).

If the notion of a symmetrical, or even normal, income distribution had empirical basis, a traditional view of long standing would be overthrown. But

[1] Stanley Lebergott, "The Shape of the Income Distribution," *Am. Econ. Rev.*, June 1959, *49*, 328-47.

analysis of Lebergott's statistics suggests that the data do not entirely support his conclusion.

In Figure 1, we have plotted the income-size distribution on the basis of the statistics which Lebergott provides in his article (p. 341).[2] The population selected consists of males, age 25-64, not self-employed. This is the basic group for which Lebergott claims to have identified an income curve that is approximately normal. As is evident from our chart, the distribution is not extremely skewed, but on the other hand it is not a symmetrical curve.[3]

As one is accustomed to anticipate in an income distribution, there is a tendency toward skewness to the right and a distinct tail at the upper end of the curve. If we were arbitrarily to ignore all incomes above $6,000, the distribution would be approximately symmetrical. But to ignore the tail is to throw the baby out with the bathwater. It is precisely the presence of an upper tail on the typical income distribution which economists have long sought to explain.

In order to provide a basis for comparison we have also shown, in Figure 1, a normal curve drawn on the same scale and with the same standard deviation as the income curve. The discrepancy between the two curves is not violent,

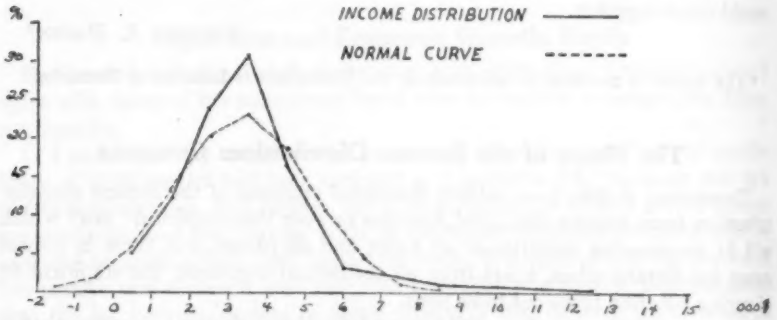

FIGURE 1. INCOME DISTRIBUTION 1951

but it is quite apparent. Considering the large size of the sample on which the *Current Population Reports* are based, a fairly close fit would be expected.

Supplementing casual empiricism with a test for goodness of fit, we calcu-

[2] I assumed a conservative midpoint of $12,500 for the "$10,000 and over" class. The unemployed and institutional population was omitted. It is not clear on what grounds Lebergott includes the unemployed and individuals making a negative income in a population which is supposed to be limited as much as possible to full-time employees.

[3] Lebergott does not plot a distribution for these precise data. He may have been misled in his conclusion, by an error made in his chart of income statistics for all males 25-64, his Figure 1 (p. 340). As his graph is plotted, the distribution looks symmetrical. But this is the result only of failure to make allowance for differences in the class interval of the frequency distribution. The distribution would show considerable skewness if it were drawn correctly.

lated a chi-square. The statistic was computed employing the conservative assumption that Lebergott's sample consists of 5,000 observations (the entire *Current Population Reports* sample is approximately 12,000). The calculation yields a very high chi-square of 521.5, which is statistically significant beyond the .001 confidence limit. That is to say, the income distribution plotted would be drawn by chance out of a normally distributed population fewer than one time in 1000. In all fairness, it should be noted that the chi-square test is very sensitive when applied to large samples. But we have ascertained that in this case, the deviation from normal would be statistically significant at the .05 level, even if the income curve were derived from a sample of as few as 100 cases. As an alternative test relating only to the issue of skewness, we calculated α_3, a measure of skewness based on the third moment of the distribution. An α_3 of 1.187 was obtained. This represents significant deviation from normal at the .01 confidence level. Similar results to those discussed here may be obtained with income data from other sources.

The analysis presented above suggests that even after eliminating the self-employed, contrary to Lebergott's argument, there are statistically significant differences between the normal curve of error and the income-size distribution. The empirical evidence does not support an approach to the problem of income size on the basis of the normal curve.

F. Gerard Adams*

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The Shape of the Income Distribution: Reply

Mr. Adams makes somewhat heavy weather over two points. One is correct (and made in my article); the other, irrelevant to it. He concludes (1) that "contrary to Lebergott's argument there are statistically significant differences between the normal curve of error and the income-size distribution." My own discussion concluded: ". . . the shape of the income distribution . . . is reasonably well defined as a normal distribution, truncated by credit rationing" (p. 345). Whoever takes that comment to imply that a truncated distribution does not differ significantly from a normal one had better mend his ways—and promptly too. Otherwise he may find both Adams and myself on his trail.

(2) Adams' central assertion is that the population "of males, age 25-64, not self-employed . . . is the basic group for which Lebergott claims to have identified an income curve that is approximately normal." His proof that "it is not a symmetrical curve," is sound. But since no such claim is advanced in the article it is irrelevant—and irrelevant at each of the three levels of significance he offers. For I made no assertions concerning the employee group he discusses. This was "a grievous fault, and grievously have I answered for it," for other readers besides Adams must have overlooked the conclusions with respect to those groups that I did consider.

After making a variety of adjustments in reported income distribution data I concluded that the 1951 money distribution for *all* males aged 25-64 (not

merely Adams' "not self-employed") ". . . is clearly much more symmetrical than the typical Pareto curve" (p. 340). I then added: "On the other hand, distinct skewness still appears. Can we explain it?" (p. 340). One lead, I felt, lay in the fact that "the most noteworthy aspect of the usual income distribution is not that it has one long tail—but that it does not have two" (p. 343); and I went on to suggest the vital role of credit rationing in truncating the distribution.

This comment offers an occasion for noting that the original article did not make explicit its limitation of reference to periods of reasonably full employment.

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Errata

There are two typographical errors in the presidential address of Dr. Arthur F. Burns, "Progress Towards Economic Stability," published in the March 1960 number of the *American Economic Review*. The first one is on page 1, line 15, where the word "understanding" should be "understating." The second one is on page 3, line 2, where "proprietorship" should be "proprietorships."

BOOK REVIEWS

General Economics; Methodology

International Economic Papers, No. 8. Edited by ALAN T. PEACOCK, RALPH TURVEY, WOLFGANG STOLPER, and ELIZABETH HENDERSON. New York: Macmillan Company, 1958. Pp. 240. $4.75.

Like its predecessors, this volume consists of English translations prepared for the International Economic Association. Also, as in the earlier issues, the accuracy and style of the translation itself is superb. Except for the rare and unavoidable instances where clarity requires direct reference to foreign usage, the volumes reads as if originally written in English.

The possible objectives of a collection of this sort are many and not all mutually compatible: The compilation of a representative sample of foreign work is quite different from a collection of outstanding contributions; material intended to further research along the lines of interest to English-speaking readers is not the same as that selected to indicate the direction of foreign interest. In the words of its preface, "Volume 8 of *International Economic Papers* covers a variety of fields and caters to a variety of tastes." This being true, it is unlikely that anyone will be enthusiastic about all the selections. In fact, general disagreement should indicate the successful application of the criterion of selection.

From one standpoint at least, the contents can be divided into four categories: (1) items of historical interest, (2) important scientific contributions, (3) minor theoretical argument, and (4) communist economics.

There are two articles in the "historical" category: The "Preface on the Doctrine of the Physiocrats" by Francesco Ferrara, dated 1850, involves a re-evaluation of the physiocrats. It is beautifully written and admirably translated, and in spirit so modern that one is almost surprised at the absence of reference to input-output tables. The other is Alfred Weber's "Location Theory and Trade Policy," doubly interesting as an example of an able mind at work applying theory to policy, and as a historical insight into the intellectual atmosphere of the Europe before 1914.

Only one of the selections is clearly of the calibre of an important contribution to economic science. That is Erik Lundberg's treatment of "The Stability of Economic Growth." His argument is: (a) that our data—especially those relating to the early period of development—are so poor that we have only the roughest idea of the real phenomena that growth theory is supposed to explain; and (b) that existing growth theories are so oversimplified that they take as fixed parameters the very things whose variation needs study. It is regrettable, however, that this oversimplification is identified with mathematical formulation and—even more dangerous—with quantitative research in general. Thus we find: "Dahmen's . . . [study of Swedish development] . . . provides us with a shocking reminder of how one-sided and narrow must be

the manner of posing the problems in quantitative models" (p. 62). If this is, in fact, a "necessity" of quantitative method, then the "multisided," "broad" approach of theory must be due to divorce from reality.

True enough, some economists—not all young, and by no means all mathematicians—are so eager for quick "results" with simple "tools" that they search for answers to questions nobody asked about an economy that does not exist. The reason mathematicians are often blamed for this is that mathematical exposition is more transparent than a sonorous prose style, and they are more easily found out.

The articles that I would classify under the heading of "minor theoretical argument," are often illustrations of this. Thus Stackelberg's "Price Discrimination in an Arbitrarily Divided Market" deals with the manner in which a pure monopolist would divide a homogeneous market in order to maximize profit via discriminating pricing. It is perfectly clear that there are no such firms, such markets, nor such objectives, and the theoretical model must be an approximation, although to what is not clear. Even in terms of the model, however, the assumption is made that the demand at any one price is independent of what is sold at any other. Such a demand would seem to imply rather strong natural divisions in the market.

Ragnar Bentzel, in his paper "On the Aggregation of Production Functions," follows an impressive list of economists in investigating the conditions under which relationships that hold for individual firms, households, etc. can be extended to a macroeconomic level to hold among social aggregates. Actually the real justification of aggregation lies in ignorance of underlying detail, or in the inadequacy of tools to analyze it with. Thus to ask when aggregates lead to the same relationships as details is to ask "when can we get something for nothing?" The answer "rarely, if ever," agrees with Bentzel's conclusions.

Erich Schneider's treatment of "Income and Income Distribution in Macroeconomic Theory" comes to grief on this very rock. His thesis is that at the microeconomic level "analysis of the formation of income is, at the same time, analysis of income distribution, and this is the reason no special theory of income distribution is needed. . . . This must needs also hold for general analysis in macroeconomic terms since the latter . . . differs only by the fact that suitable aggregation reduces the number of variables to manageable proportions" (p. 111). But it is precisely this that is wrong. Income distribution is *essentially* related to the pricing mechanism which is completely omitted from the aggregate system.

Lief Johansen develops "The Role of the Banking System in a Macroeconomic Model," constructing a system of equations which illustrate how certain "rigorously simplified" behavior parameters of the banking system might be introduced into a simple macroeconomic model of the economy.

Jürg Niehans attempts to develop "An Index of the Size of Industrial Establishments" which will meet a number of criteria of behavior. Actually, all these are satisfied by the arithmetic mean except the requirement that: "If one establishment grows without the simultaneous diminution of any other in the same group, the index should rise in the case of large and medium-sized establishments and fall in the case of small ones." The Niehans index thus

becomes a combination index of average size and of concentration, constructed by the use of weights based on a Lorenz curve, but it is not clear what it is really expected to accomplish.

The final piece of theoretical argument is the treatment by Maurice Byé of "Self-financed Multiterritorial Units and their Time Horizon." The paper is "concerned only with the proper definition of certain problems" relating to large extractive firms and conflicts of interest with small resource-owning governments. Conflicts are shown with respect to the timing of exploration, development, investment, extraction, etc. A number of ideas are suggested and partially analyzed but never clearly defined; and the paper proves to be disappointing after promising much.

The two concluding articles "Critical Comments on the Use of the Gross Production Index," by Rumen Janakieff, published in East Berlin, and "Money in Socialism" by Stefan Varga, a Hungarian economist publishing in the *Weltwirtschaftliches Archiv*, are the ones in the communist economics category. They are of considerable interest in understanding the problems of theorizing in relation to economic planning in a communist economy.

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Ökonometrie und makroökonomische Theorie. Stochastische Wirtschaftsforschung als notwendige Ergänzung der Theorie. By HEINZ STÖWE, Stuttgart: Gustav Fischer Verlag, 1959. Pp. viii, 190. DM 17.50.

Stöwe's book tries to throw a cloak of respectability on econometrics—for the benefit of onlookers recruited among German economists. It seems to be a timely effort because the teaching of economics in Germany has still quite a few links with the historical school as well as with the psychological and sociological approach. Theory expressed in mathematical form or with the help of mathematical notation is known (e.g., Schneider, von Stackelberg), but gets relatively little attention. A fortiori this applies to econometrics. On the other hand, German economists are eager to pay attention to the methodology of economics, its philosophical presuppositions, and its relation to the sciences. Therefore, to present the achievements of econometrics in works published in English, Stöwe arranges his material to suit the views of his prospective readers.

Econometrics, he says, is not just the use of mathematics or economic statistics; econometrics is also an essential element of the science of economics; or, as his subtitle has it, stochastic economic research is a necessary complement of theory. In economics, as in any other science, we observe, propose hypotheses, and then test them. Testing is not of the laboratory variety: it is based on observation of human behavior. Hence, it must allow for random elements. Econometrics with its use of stochastic relationships fills the bill. It helps the investigator to choose between those theories which are more probably correct and those less probably correct: it helps to avoid the danger of multiplying models not rejectable on the strength of their internal logic. It also supplies the economist with estimates of parameters for those theories which are accepted as being probably correct. Hence, econometrics supplies

a missing link in the structure of economic science; those paying their respects to methodology should not even blink an eye. Besides, adds Stöwe, it is in line with the views of such recognized forefathers of present-day economics, as von Thünen, Cournot, or Schmoller. This completes the proof of *seize-quartiers* of econometrics.

The greater part of the book is devoted to examples showing the use and the usefulness of econometrics in its application to macroeconomics. Stöwe chooses macroeconomics because it is in the limelight. He does not concern himself with the aggregation problem. There are, however, microeconomic problems such as costs of a firm or the study of demand of individual households which lend themselves to econometric study. These problems may have greater appeal for many theoretically minded economists for whom microeconomics is theory par excellence.

To show how econometric methods can help in estimating parameters and in rejecting unsatisfactory hypotheses, Stöwe reviews studies of Hicks' accelerator (Stöwe's own calculations relating to the German economy are compared with Gene Fisher's findings for the United States), the consumption function, and the determination of investment. Then Stöwe speculates on the possibility of applying econometric methods to the models of input-output, linear programming and the theory of games. In the discussion he shows good knowledge of the literature in the English language.

The book is clearly aimed at German economists. There is nothing essentially new in Stöwe's views that has not appeared in the English language. However, it is a worth-while reminder to his non-German readers that Leontief, Frisch, Schumpeter and others have seen in econometrics more than simply a method of prediction or an interesting field for applying one's knowledge of mathematics. Ragnar Frisch stressed that econometrics supplies us with the unification of the theoretical-quantitative approach and the empirical-quantitative approach. Leontief saw in it the statistical sifting of promising analytical insights. It is good to be reminded that due to the development of econometrics economic science is more complete and methodologically more satisfactory.

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Principles of Economics. By the Committee on Principles of Economics. New York: Pitman Publishing Corporation, 1959. Pp. xx, 873.

This long introductory text should have wide use—after all, it has 67 different authors. In the words of the editor, it is "neither exclusively classical nor exclusively Keynesian; not entirely analytical nor entirely institutional" (p. ix). Actually, the book's organization gives it more a traditional than modern flavor. Part I is introductory. Part II deals with the determination of output and prices. Part III discusses the distribution of income (personal and functional) and has chapters on social security and labor institutions. Money and banking are treated in Part IV, and discussions of economic fluctuations and stability follow in Part V. Part VI is devoted to government regulation of the

economy, and Part VII takes up international economic problems. The book ends with a section entitled "The Economics of the Future."

This reviewer has no real quarrel with the book's over-all organization, although an earlier discussion of national income determination, which in the book comes after the chapters on money and business fluctuations, might have prevented some repetition. The book does suffer, however, from the promotional device of 67 authors. Most chapters were jointly authored by two or three individuals. Unfortunately, there was no invisible hand which led each writer's contribution, no matter how excellent or poor, to combine with those of the others into a harmonious whole. The writing is uneven, both within and between chapters. The lack of a basic point of view, I believe, damages the book.

While the integrity of most of the writers led them to rather full treatments of their assignments, the result is a good deal of repetition and disproportionate discussion of many topics. The analysis of oligopoly, for example, receives the same space as the discussion of partnerships—four pages. The whole theory of market structures—pure competition, monopoly, monopolistic competition, and oligopoly—receives only ten pages more than the theory of demand (32 as opposed to 22 pages).

From a technical point of view, the book is generally competent. Occasionally, however, there are errors which represent more than simple slips. For example, pure monopoly cannot be analyzed with simple supply and demand curves (pp. 195-96); the supply of money in liquidity-preference interest theory, being a stock, has no interest-elasticity (p. 387); and Schumpeter would have been greatly perturbed to find himself classified with those who "laid the groundwork for the development and *subsequent acceptance* of Keynes' theory" (p. 23, my emphasis).

At times, the normative and teleological are improperly mixed: "One of the basic tenets of economics is that *one should always* seek to minimize costs (or efforts) and maximize returns (or results)" (p. 15). "The story of economic growth is revealed in the gradual, persistent unfolding of *man's destiny* in the realm of satisfying his material wants" (p. 57, my emphasis in both quotes).

On the whole, students will be able to learn their beginning economics from the book. Indeed, some of the chapters are well organized and well written. Nevertheless, the basic defect of the book—too many authors—seriously detracts from its usefulness as a pedogogical device.

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Price and Allocation Theory; Income and Employment Theory; Related Empirical Studies; History of Economic Thought

The Logic of Investment Planning. By S. CHAKRAVARTY. Amsterdam: North Holland Publishing Co., 1959. Pp. xii, 170. $4.00.

The general economist in quest of the theory of planned capital accumulation is likely to find this dissertation a rather difficult, if not long, struggle of

escape from habitual modes of thought and expression. There is here little of the usual substance of problems of variable factor proportions, changing production functions and intratemporal and intertemporal choice.

Chakravarty deals with a world in which there is no labor and no land; capital is the only factor of production and it does not depreciate. The relations with which he works are linear. Through most of the analysis there is a complete abstraction from money and prices, and when they are introduced in the penultimate chapter it is hard to see their significance.

The author is concerned with the problem of economic development. After a rather lengthy explanation of his "method" in which he discusses "the mathematical mode of reasoning in economics," "static" and "dynamic models," the role of initial conditions in difference equations, "optimum" versus "specified" problems (relating to methods of choosing the "open ends" or nonhomogeneous elements in the dynamic system), the "structural break," "analytical" versus "policy" problems, and the "planning tools," the author turns to a consideration of various growth models. This is a useful survey tying together within an input-output framework and interrelating the works of Harrod and Domar, Mahalanobis, Leontief, and von Neumann.

Chakravarty finds the Harrod-Domar models suggestive but overaggregative for his purposes. Discussion of Mahalanobis' two-sector model highlights the importance for growth of not merely the total of investment but investment in the capital goods industries. Von Neumann's model of balanced growth is criticized as "a somewhat remote idealization," but the author fails to consider the possibility (suggested by Dorfman, Samuelson and Solow) that such an optimum equilibrium path can be a sort of "turnpike," to which economies may well detour from their initial positions and from which they may depart as they approach their particular destinations but which may be worth the round-aboutness in terms of shortening the time of the entire trip. But in any event, most of Chakravarty's attention is devoted to the dynamic Leontief model. This is taken in Leontief's original version, involving equalities rather than inequalities in the capital-output relations so that, in effect, excess capital or idle capacity in any sector is impossible. And like Leontief, Chakravarty does not meet the problem of long-run optimization.

Whether dealing with open or closed economies and models with or without prices, the author generally presents dual approaches. For "analytical" purposes, he points out, one can take the various amounts of investment (or export balances if these are relevant) as given and ask what outputs will be at some specified period or periods in the future. Or for "policy" purposes, one can set certain targets with respect to future outputs and ask what investment would have to be in each sector to achieve them. The chief novelties in Chakravarty's treatment are his attention to "gestation lags" and the "structural break."

The latter is devised to meet the problem imposed by assumptions of linearity and constant coefficients relating investment of each sector to total saving (in turn linearly related to income). To illustrate (as the author usually does not), if an economy has no output of steel, reflecting the fact that the coefficient for investment in the steel industry is zero, it will never have any output of steel until that coefficient is changed and investment in

the steel industry is begun. Such a change in a coefficient (the only kind considered) is called a "structural break."

It will not, however, result in an immediate pouring forth of output from the previously "empty sector" because of the gestation lag. This is not handled, though, in a particularly meaningful way. For example, Chakravarty writes (p. 135, and this is consistent with his treatment of the lag through most of the book):

$$W_k = \frac{b_k}{L}\,[V_k^{t+L} - V_k^t]; \qquad k = 1, 2, \cdots, n,$$

where W_k is the investment in the kth industry, V_k is the gross output of the kth industry, b_k is the capital-output coefficient of the kth industry, L is the "gestation lag," and the superscripts ($t + L$ and t) refer to time periods.

Chakravarty's formulation, which stems from a decision (p. 88) to write investment completed between periods t and $t + L$ as equal to L times the investment initiated in the period t, can only work out consistently when each sector's investment (W_k, better written W_k^t) is constant. But this contradicts both the assumption of the structural break and the author's assumption that total investment is a (generally homogeneous) linear function of (a generally growing) income. Chakravarty's investment relation might be reformulated as:

$$W_k^t = b_k[V_k^{t+L} - V_k^{t+L-1}]; \qquad k = 1, 2, \cdots, n$$

or, using distributed lags,

$$W_k^t = \sum_{i=1}^{L} b_{ki}[V_k^{t+i} - V_k^{t+i-1}]; \qquad k = 1, 2, \cdots, n,$$

where

$$\sum_{i=1}^{L} b_{ki} = b_k \text{ and the } b_{ki} \text{ for small values of } i$$

(that is, for short lags) can be equal or close to zero.

A reformulation of this nature would of course force Chakravarty to recount the equations in most of his models (and he does devote a lot of space to counting equations and variables); but it would appear to be important, since the investment relation is the only dynamic relation and the only growth-producing relation he includes. Such a reformulation would of course not contradict one of the few *substantive* implications of Charkravarty's analysis (but one not new, for example, to those familiar with Hicks' *Trade Cycle*) that the effect of lags in the relation between investment and output is to slow the rate of growth in a growing economy.

But this is an exercise in the *formal* implications of input-output models for the allocation of investment. While the presentation is hardly sparkling, is frequently tedious and might have gained considerably from fluent English-speaking editors and copy-readers, the work is generally competent and should

prove useful for the growing number of economists throughout the world who are applying techniques of input-output analysis and linear programming to economic problems.

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The New Inflation. By WILLARD L. THORP and RICHARD E. QUANDT. New York: McGraw-Hill, 1959. Pp. xi, 233. $5.00.

During July 1958, twenty-three economists spent two weeks at the Merrill Center for Economics discussing the problem of inflation. The group included several distinguished students of the topic, and there can be little doubt that the conference was a rewarding experience for all who attended. One result is the book under review, by Willard L. Thorp, Director of the Merrill Center, and Richard E. Quandt, a participant. In light of this background one might have expected something on the order of *The Impact of the Union*—a volume containing the principal papers and ensuing discussions, together with the editors' comments. Instead, the authors have written a brief and general survey which seems quite unrelated to what went on at the conference.

Judged by the level of sophistication, *The New Inflation* is intended primarily for informed laymen. Its treatment of economic theory is neither rigorous nor detailed, references to professional literature on inflation are few, and empirical documentation is minimal. Chapter 1 is devoted to the definition of inflation, a description of United States price data, and a brief review of recent price-level changes. The next five chapters, which take up the causes of inflation, are the core of the book. Here the authors discuss the quantity theory, simple Keynesian inflation analysis, the role of structural pressures, the relationship of growth to inflation, and international aspects of the problem. The remaining four chapters deal with policy and the prospects for further inflation.

As the title of the book suggests, Thorp and Quandt have a thesis to expound. It may be summarized as follows: (1) Analysis of the periods 1948-54 and 1957-58 indicates that "prices can be pushed about by many forces in addition to, and sometimes other than, expanding demand" (p. 96). (2) Monetary-fiscal policies should be used to counter demand inflations "except when their use will cause serious unemployment or retard economic growth" (p. 228). (3) Inflations from other causes must be attacked through such policies as promotion of resource mobility, reduction of trade barriers, the fostering of investment incentives, improvement of productivity in the lagging sectors of our economy, and creation of "countervailing powers to excessive price or wage increases" (p. 228). (4) Moderate inflations are not the great evil they are commonly thought to be, and there is little likelihood of severe inflation in the American economy.

Of course, similar views have been expressed on many occasions in recent years. To this reviewer, however, Thorp and Quandt's argument is no more convincing than those of other New Inflationists. Like the others, Thorp and Quandt fail to demonstrate the novel character of recent price-level rises. Although they place great emphasis on the fact that inflation continued during

the 1957-58 recession, they largely ignore the fact that this happened as well during several recessions before the second world war. And also like other New Inflationists, Thorp and Quandt do not distinguish carefully between individual price behavior and behavior of the price level. Clearly it is not enough to demonstrate that in some instances excessive wage increases have been responsible for price rises. One must also show either that aggregate demand has increased or that resources have become idle—in both cases *because of the wage-induced price rise.* It may be that Thorp and Quandt's interpretation of the nature of recent inflation is correct, but much more hard analysis will be required before we can be reasonably certain of this.

In a sense the foregoing comments are not quite fair since *The New Inflation* does not pretend to be a definitive monograph on price-level fluctuations. As a popular work on inflation the book accomplishes much. For example, the general reader should find informative Thorp and Quandt's discussions of alternative price indexes and their shortcomings, the concept of excess capacity, and international aspects of inflation. However, the reader will have to wait a while for answers to the basic questions the authors raise in their preface.

RICHARD T. SELDEN

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Determinants of Consumer Demand for Housefurnishings and Equipment. By VERNON G. LIPPITT. Cambridge: Harvard University Press, 1959. Pp. xiv, 172. $6.00.

This study, originally a Ph.D. thesis, presents an interesting new approach to the joint use of cross-section and time series data in forecasting aggregate consumer expenditures over time. Briefly, the procedure is, as follows:

1. Analysis of variance is used to measure the numerical effect of relevant cross-section variables on the expenditure item under study. Thus, if the spending ratio (R_{ijk}) of families in the ith income group, jth family size, and kth occupation of head is influenced additively by these aforementioned variables, the estimate of this spending ratio (R) can be represented as:

$$R = r_a + r_i + r_j + r_k \tag{1}$$

where r_a is the mean, or "standard," spending ratio in the population. By means of variance analysis, estimates are obtained of the r's for different income-family-size-occupation cells.

2. Estimates of the aggregate effects of these variables are derived for years for which the necessary cross-section data are available. This is done by using the estimates derived from (1) to compute that portion of the year-to-year change in the aggregate spending ratio due to these variables. The estimate of this aggregate ratio for a given is:

$$R = r_a + \sum_i (Y_i/Y)r_i + \sum_j (Y_j/Y)r_j + \sum_k (Y_k/Y)r_k \tag{2}$$

where Y represents aggregate income, Y_i the aggregate income of those at income level i, Y_j the aggregate income of those in family size j, etc.

An equation similar to (2) is obtained for a base year, which when subtracted from (2) yields an estimate of the change in this ratio. The resulting expression multiplied by aggregate income in the given year provides an estimate of the shift in aggregate expenditures (X) attributable to shifts in the distribution of families by these cross-section variables, i.e.:

$$\Delta X = Y(\Delta R_i + \Delta R_j + \Delta R_k) \tag{3}$$

where, for example,

$$\Delta R_i = \sum_i (Y_i/Y - Y_{i_0}/Y_{i_0})r_i.$$

3. By means of interpolation, estimates of the distributional effect, ΔX, are obtained for other years in the period of observation. This variable is then incorporated into a time-series function regressing aggregate expenditures on ΔX and on such other time-series variables as may be considered relevant.

Lippitt provides a convincing demonstration of the possibilities of the method by applying it to the prediction of the demand for house furnishings for 1946-53 on the basis of time series for 1929-41 and cross-section data for 1929, 1935-36 and 1941. He demonstrates that the distributional effect, ΔX, has a pronounced effect on the expenditure ratios obtained for the benchmark dates as well as for the postwar years 1950 and 1953. The variable, ΔX, is also shown to make a significant contribution to the time-series relation, both by improving goodness of fit and increasing accuracy of prediction.

Unfortunately, the study is not without limitations, most of them recognized by the author. For one thing, underlying the feasibility of the method is the assumption of additivity of the effects of the cross-section variables, an assumption that is supported by analysis-of-variance tests on 1935-36 expenditure data. However, these tests were carried out on group averages, which are notorious for suppressing interaction effects in consumer behavior studies. To judge by some past work of the reviewer ("Service Expenditures At Mid-Century," in Conference on Consumption and Saving, University of Pennsylvania, March 30-31, 1959, to be published), had the more valid approach been followed of carrying out the analysis for individual families—an approach which, with unequal class numbers, is not exactly a statistician's delight—significant interaction effects would very likely have been obtained. If so, the procedure outlined does not produce unbiased results.

Question may also be raised regarding the extent to which effects determined from cross-section data are applicable over time and therefore can be substituted for corresponding variables in a time-series relation. The relationship obtained from the cross-section data is a static one: it does not necessarily portray what may happen with the passage of time. Thus, the fact that families earning less than $3,000 spend one percentage point less this year on housefurnishings than do those earning between $3,000 and $5,000 does not necessarily mean that families whose incomes fall below $3,000 next year will adhere to the same spending pattern as those previously at that level. It is not unlikely, however, that yearly shifts from one cell to another are generally relatively infrequent, so that the resulting biases on spending patterns are

small on an aggregate basis. This is an area where panel data would be extremely valuable.

Another question relates to Lippitt's admittedly bold assumption that the effect of the cross-section variables remains constant over time, and hence effects measured in 1935-36 are applicable to any year from 1929 to 1953. In the absence of supporting evidence, it is hard to believe that such an assumption is indeed valid. Considering the basic importance of this assumption to the validity of the method and of the results obtained, it is surprising that this assumption does not appear to have been tested, particularly considering the availability of the 1950 consumer expenditure data (though possibly they did not become available to the author until after he had received his union card).

These comments notwithstanding, there is no doubt that Vernon Lippitt has made a real contribution to means of explaining and predicting economic behavior. The general procedure may be applicable to areas other than consumer behavior. In addition the book is clearly written, well illustrated with simple examples, and could serve as a model for other technical studies of this type.

ROBERT FERBER

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Ausgaben und Verbrauch in Abhängigkeit von Einkommen und Haushaltsstruktur. By H. GOLLNICK. Hannover: Alfred Strothe Verlag, 1959. Pp. 262. DM 20.75.

In 1927-28 and again in 1950-51 the official German statistical office induced small samples of wage earners to keep diaries of their expenditures over a twelve-month period. While the summary results were published in 1932 and 1957, respectively, it remained for Dr. Gollnick to present the relationships of diverse consumer expenditures to explanatory variables and to compare the prewar and postwar data. He argues that it is useful to consider homogeneous groups when one wishes to analyze the relation of consumer expenditures to income. The original studies were restricted to families in which the head worked for wages and salaries during the entire year; Gollnick further restricted the samples to three- and four-person families (husband and wife, with either one child or two children under 21) who did not have any income in kind. The postwar study is then based on data from 697 families who did not differ much by income. The range of the annual family income is between 2000 and 8000 DMark, but the income of about 75 per cent of the sample falls between 3300 and 4700 DMark.

The author examines the relationship of various expenditures to the age of children and to differences between three- and four-person families, as well as between blue-collar and white-collar workers; but the major analyses relate expenditures to income. Thus, it is shown which expenditures remain fairly stable in different income groups, which increase proportionately to income, and which increase more than income. The expenditures for potatoes, bread, milk and sugar are inelastic; in the middle ranges are meat, eggs, and rent; and the highly elastic expenditures are for coffee, beer, clothing, furniture,

education and recreation. Most income-expenditure curves after the war are similar with those before the war. Price differentials have, however, influenced consumption. In addition, some structural changes in consumption are shown. For instance, 20 per cent less milk was consumed in 1950-51 than in 1927-28 in all income groups, although relative to other prices milk prices fell by approximately 10 per cent. "The cause for this surprising development probably is to be found in the successful weaning of the consumers from milk during the war years and the first post-war years" (p. 158). To the reviewer this explanation is more surprising than the finding itself; commonly deprivation makes a commodity more desirable so that consumption rises after the shortages have disappeared.

Although the author presents numerous regression equations and their statistical significance, the limitations of the data are not discussed adequately. A few words are said about the fact that the prewar study was conducted during a prosperous year while the postwar study took place at the very beginning of the upswing, two years after stabilization, when there was much deferred demand. No reference is made to the fact that the prewar study embraced all Germany and the postwar study only Western Germany. How the samples were selected is not discussed and possible limitations of the diary method, particularly regarding the income data, are not mentioned.

The volume with its very extensive material—there are 54 tables and 80 charts—is disappointing to the reviewer in a deeper sense, too. Because of the limitations of the material, there is no discussion of the great economic problems on which the reviewer hoped some light would be shed. In the course of a few years, West Germany rose from great poverty to widespread prosperity; how has this transformation affected consumption patterns? We cannot receive even a hint of the answer to this question because the material relates, as said before, to 1950-51 and no similar studies and no comprehensive income, savings, or expenditure surveys were conducted since that time in Germany. Simlarly, we do not receive any information on the effects of income increases, upward mobility, or consumer expectations on consumer expenditures. The differences among social classes and between the expenditure patterns of the rich—who have been excluded from the studies here discussed—and of the poor are not studied.

The usual explanation an American traveler receives in West Germany for the absence of a variety of much needed economic studies and especially of cross-section studies (in contrast to analyses of aggregate data) is lack of funds. The author of the present study also refers to this lack when he explains why he was not in a position to use electronic equipment needed, for instance, for multivariate analysis. It would be a sad commentary indeed, if it were true, that Germany, once in the forefront of scientific inquiry and today one of the most prosperous countries in the world, had not enough funds available for an economic and sociological analysis of its prosperity.

GEORGE KATONA

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Dynamic Changes of Income and its Distribution in Japan. By CHOTARO TAKAHASHI, in collaboration with RYOTARO IOCHI and KIOCHI EMI. Economic Research Series No. 3, The Institute of Economic Research, Hitotsubashi University. Tokyo: Kinokuniya Bookstore Co., Ltd., 1959. Pp. 182.

This study, concerned chiefly with shifts in income distribution over the course of the business cycle, falls into three parts. The first consists of a brief analysis of the various measures of dispersion employed in the study, while the remaining two portions, dealing with the substantive problem itself, are concerned respectively with the period up through 1944 and the postwar period in Japan. In its treatment of these two periods the study utilizes a variety of data. The analysis of the former period considers tax statistics (on personal income and profit) and wage data classified by industry and sector of the economy, while the analysis of the postwar period employs income tax statistics, special studies of family income and expenditure, and welfare survey.

In so far as the main problem of the study is concerned (the cyclical relation between income level and income dispersion), the results are inconclusive. Much of the data, particularly those dealing with the period up through 1944 (where the data sometimes cover several decades) indicate that income dispersion grows during the period of expansion and falls during the period of contraction. (A notable exception to this pattern is the period of the second world war itself; and it may be noted further that, for the first time over any comparable period covered by the statistics, the data clearly show a movement toward greater equality since the war's end.) However, the statistics revealing the parallel cyclical movement of income level and income dispersion are largely those drawn from tax returns up through 1944. Owing to the high exemption level, as the study notes, the personal income tax returns cover only the highest 10 per cent of the income recipients and account for only a fraction of the national income. The data thus reflect changing cyclical dispersion mainly among property-income recipients.

Though the wage data are not comprehensive, the analysis here does in fact suggest (along with a portion of the welfare survey findings) that, cyclically, the level and dispersion of income among the lower-income groups move in opposite directions. This movement, as is observed, may well overbalance the effects of any wage lag relative to profits during both phases of the cycle and determine the pattern for the distribution of income as a whole. If so, this would conform to the findings for the United States which, at least for the period 1939-1949, indicate that, owing to a variety of movements affecting lower and middle income groups (movements to jobs with higher pay or lower income dispersion, a reduction of income differentials, a rise in the number of full-time workers, and an increase in the number of supplementary family workers), income inequality declined for the distribution as a whole. (Cf. Herman P. Miller, *Income of the American People,* New York: 1955, esp. Ch. 8 and 9.) It may be noted that a recent study, *Employment Structure and Business Fluctuations,* by the Economic Planning Agency in Japan, indicates

that, owing to the attractiveness of higher wage rates, here too the number of supplementary family workers increases during periods of prosperity, and that the common supposition that, over-all, such workers swell the labor force during periods of contraction (in an attempt to maintain family income) is incorrect.

It appears that Takahashi and his collaborators have made extensive use of available statistics in Japan in their painstaking analysis. Indeed, in view of the (acknowledged) inadequacies of the data bearing upon the central issue, the statistical analysis may well appear too painstaking. As the statistics are presented segmentally (with each type of data considered separately and in a rather unintegrated fashion), the study sometimes leaves the reader in doubt concerning the rationale of the procedure and the authors' own views on the general significance of their findings. The authors, however, offer their work mainly as a preliminary exploratory venture, not as an argument in confirmation of a specific hypothesis. As such the work will provide material (particularly on various subsidiary movements revealed by the different types of data) for those studying the same question in other countries and will serve as a pathbreaker in a field which is certain to grow in importance in Japan.

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Wirtschaftsgestaltung. By HANS BAYER. Berlin: Duncker & Humblot, 1958. Pp. xvi, 758. DM 58.60.

As an economist Hans Bayer was brought up in the tradition of the Austrian School. He began his career as an assistant to Professor Mayer at the University of Vienna, taught as professor of economics at the University of Innsbruck, and is now director of the Sozialakademie Dortmund. Of his writings, *Wirtschaftsgestaltung* is up to now the most significant. It represents a synthesis of economics, achieved through an applied theory of economic tensions (*Spannungen*). In his aim for synthesis Bayer is progressing along the road indicated by Johan Åkerman (*Das Problem der sozialökonomischen Synthese*, Lund 1937); in his systematic attempt to view the economy as a complex of economic tension relationships he is making an original contribution to dynamic economic theory.

The first part of the book is an exposition of the modern problems of national and world economy as well as of those that have arisen in the course of economic history. Through this exposition the basic relationships in the economy are recognized, and illustrations are provided for the second part of the book which constitutes a theory of economic tensions. Existing theories are found to consider economic tensions only to a degree. In his own analysis of tensions Bayer distinguishes (1) tensions between relative and absolute values, (2) tensions between consumption and production, (3) tensions between the economic spheres of money and goods, and (4) tensions between the individual and society.

Testing his theory on four models (simple economy, free competition, monopoly, and monopolistic competition), Bayer puts to excellent use the suc-

cessive approximation techniques of the Austrian School. The model of simple economy (Friedrich von Wieser's *einfache Wirtschaft*) corresponds to the principle of *Wirtschaftsgestaltung*, where "the decisions are from the outset directed toward the achievement of all-over goals" (p. 454). The concept of *Wirtschaftsgestaltung* does not, however, exclude free competition.

The comparison of the models is tied to the question of the possible reduction (*Überbrückungsmöglichkeiten*) of tensions which exist in various models, because it is through the reduction of tensions that the goal of the economy can be reached. In contrast to the view championed by Max Weber, which limits the economist to the analysis of what *is*, Bayer's system is oriented toward absolute values, and these can be arrived at ontologically. From such perspective the goal of the economy is "to secure constantly the widest possible material basis for the development of personality" (p. 417). Of the four models, that of the simple economy is the best suited to lead toward the achievement of this goal. The model of monopolistic competition is found to be the least satisfactory because "from a national-economic standpoint monopolistic competition essentially combines the disadvantages of free competition and those of the monopoly" (p. 476).

The realization of the model of simple economy is dealt with in the third part of the book. The investigation shows possibilities of wide decentralization, which permits an unrestraining (*freiheitlich*) realization of the model. Through co-ordination of autonomous social forces (*Ordnung von unten her*) only a few residual tasks are left to the central authority (*Ordnung von oben her*). Thus Bayer closes the circle which leads from empirical evidence by the way of theory back to the solution of actual problems indicated at the outset. In the successful application of theory to current economic problems lies the significant difference between Bayer and the Austrian School which, finding complacence in the theory, failed to provide solutions to the pressing questions of its time.

Bayer's style is lucid and pervaded with a sort of *Gemütlichkeit* which comes to expression in colorful analogies and examples. Much of the material which Bayer uses as empirical evidence has been collected during his travels through Europe, America, and Asia. His impression of a certain relaxation in Chinese planning would have to be re-evaluated in the light of the introduction of the communes in 1958. While there was some decentralization of decision-making because of the new small-scale industries operated by the communes, there resulted also a weakening of the position of the family, which Bayer considers an important factor in the *Ordnung von unten her*. A thorough application of tensions apparatus—*mutatis mutandis*—to the communist system would be of great interest, but this would be too much to demand from the single-handed author who, as it is, has shown an intimacy with the modern theoretical and practical literature which would ordinarily be expected only from a team of specialists.

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Economic History; Economic Development; National Economies

The Comparative Study of Economic Growth and Structure. New York: National Bureau of Economic Research, 1959. Pp. viii, 200. $3.00.

This is a report on two National Bureau conferences which considered research objectives in the area of comparative national economic growth and structure. Part I, by R. W. Goldsmith, presents the results of the exploratory survey at these conferences, while Part II reproduces eleven supplementary memoranda by individual economists (Aubrey, Cairncross, Colm and Geiger, Goldsmith, Hagen, Hirschman, Hoselitz, Kuznets, Reynolds, Spengler, and Tinbergen).

Obviously the basic questions involve the selection of what problems are to be examined, in what countries, during what periods, and with what methods. Goldsmith offers such answers as the following: the selection of topics should be guided primarily by the contribution they can make to an understanding of the character of the growth process and the relative importance of the various factors which retard or accelerate it; these findings should be expressed wherever possible in the form of measurable relations; the comparative study should be world-wide, free from dependence on Western industrialized capitalistic societies and the experience of the last century; particular attention should be given to a systematic and statistically founded study of the early stages in the development of countries that are now advanced; the statistical techniques should be related mainly to an extensive use of the national accounting approach, with only secondary reliance on formal econometric models and input-output techniques. In view of our fragmentary knowledge of growth, it is understandable that these answers must necessarily be simply suggestive. Indeed, the report lists more than a hundred substantive problems regarded as directly relevant and important.

The selection of an order of priorities within such an overwhelming catalog is but one basic problem confronting those making comparative studies of growth. Another is that, although comparisons can best be made in terms of a typology of countries and phases of development, there cannot be a "correct" typology: one typology can only be considered as more convenient than another, depending on the choice of problems. It is therefore a somewhat meaningless exercise for Goldsmith to offer a "master list" of 20 countries, although he would justify it by his desire to have comparative studies cover as much as possible of the world's population or income, together with an "adequate" representation of countries situated in different parts of the world, and of countries having different levels of real income per head, different dominant branches of the economy, and different economic systems.

We may also wonder just how instructive a comparative study can be if its major emphasis is limited to the economic aspects and the quantitative dimensions of growth. For the sake of efficiency in research, Goldsmith suggests that comparative studies start with the economic aspects and leave the integration with noneconomic factors to the future. This, however, presupposes that the economic and noneconomic aspects can be examined in simply a serial or additive manner—a dubious proposition. An interdisciplinary ap-

proach is also necessary to modify the economic analysis itself. Although Western economics is not irrelevant for poor countries, its application to particular countries does require amendment according to the institutional environment and specific social and cultural factors. Moreover, some of these ancillary disciplines have used the comparative approach much more than has economics; recourse to the knowledge they have accumulated would strengthen the methods and results of comparative economic studies.

The emphasis on the quantitative approach may also be unduly narrow. As Cairncross suggests, its adoption "necessarily introduces a bias to the analysis of economic growth, since it concentrates attention on what can be and has been measured, while other changes that may be of more fundamental importance are slurred over, and the causal interconnections that such research aims to establish may not emerge at all" (p. 106). In their memoranda, Hagen, Hirschman, and Hoselitz also support this view.

The diverse viewpoints expressed in the several memoranda defy any general summary. These are, however, strong individual statements, and a reader may accordingly find them more provocative than the broader survey in Part I.

Finally, the proposed organization of a center for comparative quantitative study of economic growth will be welcomed by the student of growth (unless he is already immune to the establishment of yet another center). Such a center could perform the valuable functions of systematically collecting comprehensive data, testing hypotheses, integrating the comparative studies of individual researchers, and training specialists in comparative quantitative studies on an international scale.

It is to be hoped that this report will generate considerable response. For despite the continuous flow of country studies, there is still a dearth of systematic and thorough comparative studies. Serious attention to the pertinent suggestions offered here could do much to overcome this deficiency.

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An Econometric Model of Postwar State Industrial Development. By WILBUR R. THOMPSON and JOHN M. MATTILA. Detroit: Wayne State University Press, 1959. Pp. viii, 116. $3.00.

This short volume reports the results of a 48-state multiple correlation and regression analysis of employment growth for the period 1947-1954 in 20 manufacturing industry groups taken from the two-digit classification of the Census of Manufactures.

Thompson and Mattila begin by computing simple correlation coefficients between annual average change in total employment and 13 "independent" variables representing 5 classes of factors which might be expected to influence interstate differentials in employment growth: prior growth of the local market, prior industrialization, state and local taxes, labor market characteristics, and educational levels and facilities.

They find that those variables chosen to represent the prior growth of the local market—state population and income changes (1940-1947)—show a

fairly high degree of association with subsequent employment growth. Any implications of causality are, however, unwarranted. This is particularly true since the degree of association is highest for such industries as transportation equipment, instruments, fabricated metal products, and paper and allied products, which, with the possible exception of some branches of the fabricated metal products group, can hardly be expected to depend on the local market for their growth.

The second group of variables—average annual change in employment in all manufacturing 1939-1947, expenditures for new plant and equipment, and average annual number of patents issued to new residents, 1946-1948—are chosen to represent the prior degree of state industrialization. Of these variables, the correlation coefficients are generally statistically significant and of the expected sign (but exceed .8 in only two cases) for the durable-goods industries, but for only paper and allied products among the nondurable-goods industries.

The variables chosen to represent state and local taxes do not show significant association with employment growth in any industry.

Labor-market characteristics are represented by average annual earnings in manufacturing, 1949, and by estimated trade union membership as a per cent of nonagricultural employment, 1947. The only significant associations of the expected sign occur in the apparel industry, in which employment growth correlates negatively with both labor-market variables used. The authors recognize that they might better have included a productivity index among their labor-market variables.

The final variables relate to educational levels and facilities. The average level of education, represented by median school years completed by persons 25-years old and older, 1950, shows significant association with employment growth in only the lumber and wood products industry—a most surprising result if given a causal interpretation. The two college variables—number of college graduates, 1950, and total staffs of institutions of higher learning, 1947-1948—show significant association with employment growth in the durable-goods industries and in paper and allied products.

The bivariate analysis is followed by a derivation of multivariate employment-estimating equations for the 20 industry groups. The two variables which show the closest bivariate association with employment growth in each group are combined into multiple regression equations. Because of the high degree of intercorrelation between the variables which show a fairly high degree of association with employment growth in the bivariate analysis, the coefficients of multiple correlation for the estimating equations are appreciably higher than the simple correlation coefficient for the best single explanatory variable only in scattered instances.

The authors supplement their study of average annual change in total employment with a parallel analysis of the rate of growth of employment. The results of this second foray are only marginally different from those of the first.

How well does this volume fulfill the authors' stated purpose: "to learn

more . . . about the basic causes of the growth and decline of state economies" (p. v.)? The major positive result of the study is that employment growth in the durable-goods industries is associated with prior industrialization (i.e., that agglomerative factors are at work in these industries), and that it has taken place in the richer states which had a relatively large number of college graduates at the beginning of the period. Apart from this result, the study offers few plausible generalizations.

To the reviewer, the meagerness of the findings suggests that the model is overly aggregative. The findings probably would have been far richer had separate models been formulated for that portion of manufacturing which serves the national market, and for that portion which is more purely residentiary. Further, the explanatory variables used do not include productivity-adjusted cost data. Such data are difficult to obtain and their use would probably require separate models for each of the nonresidentiary industries. However, it is likely that satisfactory results would have been achieved through their use.

In their preface, Thompson and Mattila tell the reader that what they offer is "primarily a bit of *our* education as grist for *your* educated guesses." The regional specialist who keeps its tentative nature in mind will benefit from a close examination of this work.

WILLIAM WOLMAN

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The Social Evolution of Industrial Britain: A Study in the Growth of our Industrial Society. By L. G. JOHNSON. Liverpool: Liverpool University Press, 1959. Pp. viii, 178. 25 s.

Dr. Johnson, senior lecturer in economics in the University of Leeds, has written a particularly timely study. In a period characterized by the wave-like spread of the industrial revolution to new areas, attention has recently been focused on the technological achievements of the past two centuries, because of the interest in accelerating the "take-off" of the industrial development of the new industrial nations. But this preoccupation should not be permitted to lead us to overlook the pool of social and political experience which has accompanied industrial development.

This thoroughly documented essay on the economic and social influences and the politico-economic views which played their part in the integration of the British working class into British society is a basic companion piece to the recently well-publicized researches of W. W. Rostow into the stages of industrial growth. Rostow's analysis of the patterns of industrial development makes due allowance for the role of nationalism, in all its cultural ramifications, in determining the crucial choices which are made as industrialization reaches "the dangerous stage of maturity." The choices of mass consumption or welfare arrangements are viable, but the third alternative, that of the pursuit of external power and influence, requires redirection in our modern world. The position occupied by the working class in an industrial economy is a basic determinant of these choices.

Johnson's study serves to explain one of the Marxian misjudgments, noted by Rostow, that the working class accepted the framework of private capitalism when it was combined with political democracy. His study treats historically of the manner in which working class integration was actually achieved, the profound causative economic changes, and the prevalent views among statesmen, economists, idealists, spiritual leaders, statisticians and working class leaders in regard to the proper form of integration. What emerges is the significance of the working class not merely to the economic development of Britain, but also to its political and cultural development.

Working class integration into British society was the product of a complex of factors. These included the British genius for accommodating to heterodoxy, the wealth of the free enterprise economy and the rise in real wages, and the democratic experience gained by workers in their private self-help organizations, including the cooperatives and the unions. In the first stages of demographic and technological revolution at the start of the last century, the peopling of the new industrial centers was accomplished by the workers themselves. Although uprooted from native habitats, they remained in their own country. They carried with them the British traditions of Parliament as an "institution of community," of an interest in education despite its limits, and of the community spirit to which the religious evangelical movements had contributed. They cooperated and they made contributions to technological change, accommodating themselves to the new environment rather than seeking a recreation of society as contemplated by Owenite communism. The community spirit was reflected in the growth of savings banks and mutual benefit societies, in which experience was gained for the later organization of cooperative organizations and trade unions.

The expanding influence of the working class through trade union organization was formally recognized with the enfranchisement of the workers and the trade union legislation of the 'sixties and 'seventies. Conservatives and liberals vied for the political support of the workers, thus hoping to achieve social harmony. Others decried the divisive influences of trade unions, functioning as restrictive combinations, violative of the common law. The trade unions conformed to neither view, as Johnson points out. They served to make explicit the distinction between capital and labor, rather than serving as agents of social unity. On the other hand, rather than plunging society headlong into anarchy, they contributed to the increasing vigor of a society which was moving "to a new position of equilibrium."

The independent political role taken by the labor movement at the turn of the century was the product of many influences. There was an abiding concern with the state of the working class among all classes of British society. The "problem of poverty" and "the state of the people" were matters of widespread concern. Fabian socialism, with its perspectives rooted in working class efforts through trade unions and cooperatives, held Parliament to be an institution which represented the interests of the entire community. The strains of Utopian socialism also continued to have their influence for, in the author's view, they were rooted in the community sense of working people, with their zest for the cultural and spiritual interests in life, as well as the material. It is

political and religious freedom with its attendant pluralism and community spirit to which the author attributes the direction which the British social fusion has taken.

Johnson's book is not only a tract for the times for the newly emerging industrial economies. It is also an appeal for understanding within Britain itself. As he points out, the wartime dislocation of the British economy placed the country virtually in the position of an underdeveloped country with regard to future economic orientation. Trade union leaders had to work together with management and politicians to raise levels of production in key industries. In assessing the economic prospects and problems which confront Britain, the author cautions against the tendency to the shortening of memory which comes with the apparently incessant changes accompanying industrialization. His is an appeal to the realization of the role of political democracy and community identification in meeting the new technology, the requirements of productive efficiency in the present intensified competitive world situation and in the possibility of reorientation in collective bargaining. The British experience cannot be recapitulated in detail elsewhere; but the connection between democracy and the integration of the working class into society does have universal applicability. It is a major assurance that the viable choices will be made by the mature economy.

JOSEPH P. GOLDBERG

Washington, D.C.

De Caboul à Pékin: rhythmes et perspectives d'expansion économique. By GILBERT ÉTIENNE. Geneva: E. Droz; Paris: Minard, 1959. Pp. 268. 20.—sw. fr.

The author's aims in this book are to describe the differences characterizing nine Asian economies (Afghanistan, Thailand, Cambodia, Malaya, Ceylon, Pakistan, Indonesia, India and China), and to compare and assess their efforts to maintain or raise levels of living in the past decade. "Level of living" is viewed mainly in terms of per capita food consumption. Consequently, both the data and discussion emphasize population and food production ratios, time series, and growth rates. Though reference is occasionally made to nonfood crops, as well as to industry, transport and services, the author often seems to look at the population-food relationship in terms of closed economies, and hence to overlook the relevance of specialization and international trade. If the rate of population growth exceeds that of domestic food production, it doesn't necessarily follow that investment and technical assistance should be concentrated in agriculture. Though this inference may in fact be warranted in several of the countries Étienne visited and studied, the relevant considerations entail comparative costs and prospective terms of trade, not simply demographic trends.

The descriptive material used by Étienne is accurately and conveniently arranged to facilitate a quick overview of each of the countries covered. There is, however, very little that is new in his account, and one can find more complete data in the U.N. Demographic and Statistical Yearbooks, and the annual Economic Survey of the Economic Commission for Asia and the Far

East. Still, there are some surprises; for example, the natural rate of population increase in Malaya is 3.4 per cent and in Ceylon 2.8 per cent; and the Chinese have contrived various "anti-Malthusian" arguments for regulating population based mainly on improving the health and productivity of mothers, and increasing their annual working days! Readers interested in a readily intelligible survey of some of the main facts and problems concerning economic development in the Asian area will find the book worth a rapid reading.

The first third of the book deals with Afghanistan, Thailand, Cambodia, Malaya, Ceylon, Pakistan and Indonesia. Étienne groups the first four together because of their relatively favorable progress and prospects for reaching or maintaining a "tolerable" standard of living, which he defines as a daily per capita consumption of 2,000 calories and an annual per capita income of $100 dollars [*sic*]. Ceylon is discussed separately as "a more difficult case," because of its high rate of population growth and its resource limitations. Pakistan and Indonesia, "where problems become more complex," are also viewed rather pessimistically; Pakistan, because of soil depletion, resource limitations, and its geographic split; Indonesia, largely because of administrative and political shortcomings.

The remaining two-thirds of the book is devoted to a description and comparison of the development plans and progress of India and Communist China. Up through the end of 1957, Étienne finds India's growth slower than China's, but not uniformly so. In machine-tool and textile production, for example, India's percentage growth rates exceeded China's, and in basic food production India's percentage growth in per capita output slightly exceeded China's. But with the "great leap" of 1958 and 1959, China apparently moved ahead by a substantial margin in all fields. Although Étienne doesn't provide better data than have been available before, his interpretation of the official data and their significance seems well balanced. Without presuming the data to be entirely accurate, he stresses that the relevant issue isn't whether they are off by 10, 20, or 30 per cent, but rather how, regardless of the reasonable corrections that might be made, the growth that remains has been so large relative to India's. In seeking answers he stresses China's success in mobilizing its masses for capital-creating uses, its concentration on raising agricultural yields rather than attempting to increase cultivated area, its decentralization of industry and its encouragement of sharply differing technologies in a given industry to take advantage of dispersed resources and varying labor costs and skills. Even though the disenchantment with backyard furnaces occurred after his book went to press, Étienne is probably right in suggesting that some of China's methods of accelerating growth may be relevant in noncommunist countries as well.

Étienne concludes on a hortatory note concerning the need for the noncommunist countries in the Asian area to step up their own development efforts, to profit from China's example in so far as it is relevant, and to obtain more external assistance from the West, though he doesn't find ground for optimism on any of these counts.

CHARLES WOLF, JR.

The RAND *Corporation*

The Welfare State in New Zealand. By J. B. CONDLIFFE. London: Allen & Unwin, 1959; New York: Macmillan, distributor. Pp. 396. 35 s.

J. B. Condliffe is one of New Zealand's most visible exports. He left New Zealand about 30 years ago, after a period as professor of economics at Canterbury University College (now the University of Canterbury) and has since served with distinction in the United States and in international economic organizations.

His book, *New Zealand in the Making* published in 1930, has long been regarded as the standard economic history of New Zealand, and it was with great pleasure that New Zealanders heard that he intended to revise this work and to extend it to cover the important economic and social events which have occurred during the past three decades.

In the event, he has produced two new books—firstly, a revised edition of *New Zealand in the Making*, which concentrates primarily on the economic history of New Zealand up to 1935, and secondly, the book under review, which is mainly concerned with the story of the new period of social and economic experiment which began with the advent of a Labour Government in the mid-thirties. It is incumbent upon the reviewer to point out, however, that important aspects of the more recent period, such as the adaptation of the Maori people to economic and social change, and the growth of certain industries, are covered in *New Zealand in the Making*, while important features of the earlier period, such as the earlier history of borrowing for development or of the regulation of wages by the state, are dealt with in the book under review. Thus, the reader who wants a reasonably complete picture of developments in either period must necessarily consult both works.

The Welfare State in New Zealand can be recommended as providing a very fair and comprehensive assessment of New Zealand's economic and social history during the past twenty-five years. After the first two chapters which deal with the impact of depression and the "insulation" policies of the Labour Government which was in office between 1935 and 1949, the book takes the form, not of a connected historical narrative, but of a series of essays on the structure of the economy, borrowing for development, the economic functions of government, the regulation of wages, social welfare policies and New Zealand's role in the world. This method of approach may make it difficult for the overseas reader to obtain a clear picture of the background against which changes in policy have taken place, especially in the period after 1949. Nevertheless, he will find a useful collection of information, not available in such convenient form elsewhere, on the subjects mentioned above, together with an objective assessment of the policies followed by successive governments during the period.

It is, of course, difficult for the writer of a history book to satisfy all of his readers with the relative emphasis which he gives to various topics. In future editions, I would myself welcome a fuller analysis of the effects of the measures taken to try to stabilize the incomes of exporters, measures which are rather sketchily analyzed in Chapters 2 and 3. I find the treatment of state regulation of wages inadequate because it fails to discuss the important system of

varying minimum award rates of wages by General Orders of the Court of Arbitration. And, in the last chapter, on New Zealand in the World, it is surprising that so much emphasis is placed on New Zealand's relations with its island dependencies and with Asia, and so little space given to trade relations with Britain, Continental Europe and the United States, to the preferences accorded to and received from the United Kingdom, and to New Zealand's role in international economic organizations, particularly GATT.

However, despite these limitations, it can confidently be said that there is no better book available on New Zealand's recent economic and social history.

F. W. HOLMES

Victoria University of Wellington, New Zealand

Portrait of a Modern Mixed Economy: New Zealand. By C. WESTSTRATE. Wellington: New Zealand University Press, 1959. Pp. x, 310. $4.75.

The author calls his book a Portrait of the New Zealand economy, but its style and organization might better be described by the word Anatomy. Professor Weststrate, who came to the University of New Zealand from a chair at Leyden, defines his approach as "morphological, or rather characterological," deriving from the work of Sombart and Eucken. What he does is to examine each of the main features of the economy and to ask an economist's questions as to the effectiveness with which it functions. After analyzing the mixture of collective and individualistic elements to which its title refers, the book discusses in turn the purposes of public policy, the continuing dependence on external trade, and the rate of economic growth.

"Far from being a simple agrarian economy," New Zealand "is a modern mixed economy with all its complexities. It shows communal control of economic life in many forms. It has an important public-enterprise sector," most of which antedates the Labour Party and owes its origin more to opportunism than to dogma. "The corporate elements" in the economy "are numerous and some of them are influential." By this term, which may startle his New Zealand readers, Professor Weststrate refers to the marketing boards for primary products which exercise governmental authority but are largely operated by representatives of the organized producers. "Communal care of individual welfare . . . is well developed"; the "wings" of the welfare state have a wide span and give remarkably full cover. Finally, the system of compulsory arbitration represents "an unusual element of central direction."

Morphology without genetics makes hard reading. Many students will prefer to learn about the welfare programs in an account that traces their origins to two periods of national emergency and about the marketing boards in an account which places the battles over their formation in their social and political setting. These they may find in J. B. Condliffe's book on *The Welfare State in New Zealand*, and many will also feel the need of the background of development provided by the same author's *New Zealand in the Making*.[1]

[1] J. B. Condliffe, *The Welfare State in New Zealand* and *New Zealand in the Making*, London, 1959. The second of these volumes is a substantial revision of a book first published in 1936.

Professor Weststrate's method gives no opportunity to examine the degree to which the special characteristics of New Zealand derive from its origins as a "new" country and from the circumstances under which the small man's industry of dairying came to overshadow the large man's industry of wool-growing.

On the other hand, students of comparative economic organization will find particular value in a book specifically planned to permit international comparison. The author looks at the New Zealand scene with the eyes of a scholar whose principal training and experience have been obtained elsewhere. A native of the country would probably not have called attention to the almost complete absence of anti-trust legislation or related the marketing agencies to Portuguese and Dutch corporatism. Some of the specific comparisons are of considerable interest. According to the estimates presented, New Zealand is second to the United Kingdom both in the proportion of gross national income devoted to welfare measures, as compared with the Netherlands, Sweden and Australia, and in equality of income distribution, as compared with Sweden, Denmark, the United States and the Netherlands. Economists will respect the persistence with which the author presses the question of the economic consequences of the measures examined, even though the answers are often admittedly inconclusive. They will appreciate also his demonstration that the purposes embodied in public action—such as economic development, full employment, stability of agrarian income, greater equality, and "some insulation from disturbances from overseas"—are not in all cases fully compatible. Some at least of these incompatibilities are, as he suggests, characteristic not only of New Zealand but "more generally of the modern mixed economy."

CARTER GOODRICH

Columbia University

New Forces in American Business: An Analysis of the Economic Outlook for the '60s. By DEXTER M. KEEZER and Associates. New York: McGraw-Hill Book Co., 1959. Pp. 278.

Will the American economy sustain through the next ten years the "remarkable record of both growth and stability" it has experienced since 1946? Mr. Keezer and his associates of the McGraw-Hill Department of Economics give a confident, affirmative answer. They foresee "relatively steady growth and prosperity" over the next decade as a result of institutional changes which make the economy basically different from what it was before the second world war. The argument behind this unequivocally stated forecast is clearly and forcefully outlined in this well-written book addressed to both businessmen and professional economists. The latter, however, will find the book more useful as something to recommend to laymen and undergraduates than as a source of new or deeper insights into the workings of an awesomely complex economy.

The only major qualification to the prognosis is that although the general condition will be one of growth and prosperity over the decade, the actual

time-path will be somewhat irregular, and, say the authors with equanimity, short periods ("months") of unemployment amounting to 6 or 7 per cent of the labor force are likely. Technological bottlenecks will be as important here as dips in general business conditions. For recessions of this magnitude the authors would rely on automatic stabilizers and the inherent recuperative powers of the economy—and on generous unemployment compensation. More in the nature of assumptions than qualifications are the views expressed on the prospects of a major war (none expected), shortages of basic resources (none before 1970), the intrinsic social value of economic prosperity (beyond the scope of their book), and the "prospective capacity of corporate management to do its job" effectively (not a problem). Readers will vary in their judgments as to how these premises affect the authors' conclusions.

Unlike most optimistic forecasters, the authors take pains to state and answer the arguments of those who are fearful about the continued good health of the U.S. economy. Specifically, they reassure those who fear the following: (1) a depression brought about by a relaxing of international tension (the rebuttal: rising, not falling, defense spending is much more likely); (2) runaway inflation caused by excessive wage demands of organized labor or greedy exercise of monopoly power by large firms (ample productive capacity, increased competition, rising output per man-hour, public resistance and disapproval); (3) inflation, or maybe recession, induced by chronic agricultural surpluses (the probability that direct subsidies will replace supported prices in the one case, and the magnitude of the problem relative to the magnitude of a growing, prosperous economy in the other); (4) disaster due to irresponsible federal fiscal policies, either deficit-generated inflation (monetary and credit controls) or tax strangulation (greater efficiency in defense spending, public and official awareness of the need to reduce taxes, the growing tax base); or (5) that the state of economic knowledge is inadequate for the job of keeping our complex, $500 billion economy on an even keel (no problem).

But the authors reserve their big guns for the problem of maintaining over a long period a rate of investment sufficient to support full employment. They agree with those who maintain that adequate investment is the essential condition for achieving both short-run stability and sustained growth. But whereas many economists might then argue that a high level of investment leading to expanded productive capacity (and higher levels of production, income, and consumption) will eventually slacken and fall because the stock of capital will have outdistanced population and consumption and thus further investment will become unprofitable, Keezer and his associates are confident that structural changes in the U.S. economy in the past decade or two have made it not only possible but likely that the levels and rates of change in private investment (and hence in productive capacity), aggregate demand, and the supply of labor will be such that reasonably continuous prosperity will prevail for at least the next ten years. The analysis behind this conclusion considers these structural changes according to the familiar categories: private investment, consumer expenditures, government demand, and export demand.

In addition, the authors place great emphasis on the role of industrial research, "the key to growth and stability."

Three major forces are identified as promising to sustain the rate of growth of private investment: fewer hours of labor relative to population as the latter expands; a "formidable backlog" of overage and antiquated productive facilities; and the greater importance of industrial research and the subsequent innovations. This ever-growing industrial capacity will be supported, the authors think, by a growing population, consumer commitments to high levels of spending relative to income, and the development to a fine degree of the "arts of marketing" which can be used "to increase the inclination to spend."

Although this reviewer agrees generally with the optimistic view of Keezer and his associates, he cannot help but feel that they have seriously underestimated the problem of purely technical maladjustments in, particularly, the investment sector and overestimated the willingness of consumers to spend, year in and year out, at the necessary rates. Even granting the high state of the marketing arts to which they refer, one suspects that the heavy artillery of fiscal policy may well be needed in order to achieve the kind of stability and steady growth the authors optimistically predict. It is also possible that the increasingly glaring gap which they anticipate between the level and quality of private and social goods may act as an obstacle to the rate of growth they envisage so confidently.

JAMES E. HOWELL

Stanford University

American Economic History. By DONALD L. KEMMERER and C. CLYDE JONES. New York: McGraw-Hill Book Co., 1959. Pp. xv, 680. $7.75.

This new text has been designed primarily for use in lower-level courses. Its 31 chapters are organized around a conventional framework of four eras ending in 1789, 1860, 1914, and 1959, respectively. In each of these periods, except the colonial, a chapter is devoted to each important phase of the economy such as transportation, agriculture, money and banking, labor, and so on. Besides maps, charts, pictures, and tables, the volume contains a valuable annotated bibliography (pp. 612-45) and an index. Jones takes credit for the eight chapters on agriculture, transportation, and labor.

Kemmerer and Jones seek to apply general economic principles to the treatment of history, and point with pride to their general theme: that since 1860 this nation has been confronted with overproduction. Before 1930 the manufacturers and railroads sought to meet the problem by controlling production or organizing the market in one way or another; and with the New Deal the federal government adopted the very same philosophy of production control. Other economic propositions which show up quite consistently are to the effect that tariffs are bad in proportion to their height; that hard money, particularly gold, is inherently superior to paper money because of the danger of paper inflation; and that it is better for a nation to finance itself by taxation, even in time of war. Although the authors carefully state both sides on controversial issues, the reader is left with a general impression that we need a return to the economics of the pre-Keynesian era.

In general Kemmerer and Jones appear to have their facts in good order; and they have done an excellent job in marshaling a countless number of items of information. Those with a statistical bent will like the liberal use of index numbers. In this connection I would advise a recasting of the account covering commodity prices between 1800 and 1860 (p. 196). Kemmerer notes that although the currency situation during that period was quite unstable, "the price level did not vary markedly," and he ascribes such price stability to the employment of bimetallism. The difficulty lies partly in the choice of terminal years and partly in the choice of index numbers. The figures he cites are identified with the Snyder-Tucker general index, of which wholesale prices are a minor component, and which has an amplitude of variation only about 50 per cent as great as wholesale commodity price indices. New York wholesale prices rose about 100 per cent between 1790 and 1814, declined over 40 per cent between 1814 and 1821, recovered substantially until 1837, then dropped to a low point in 1843 some 60 per cent below the peak of the War of 1812. And the extent of inflation in the 1830's was considerably greater in the West and South than it was on the Eastern seaboard. This is, of course, a minor degree of instability compared with the hyperinflation of the American Revolution, in the South during the Civil War, or in Germany and Russia after the first world war. Nevertheless, the American price experience in 1790-1860 was comparable with that in the North in 1860-1914, or in the nation as a whole between 1914 and 1959.

Kemmerer gives a masterful account of events during the 1930's and shows a better sense of proportion on "The Great Depression" than any other authors whose works have come to my attention. In his account of events leading up to the bank holiday, however, he gives little if any emphasis to the bank difficulties in Detroit in January 1933, which have always impressed me as a prime factor in generating the tornado which swept the nation later on. Will we ever know exactly what happened in Detroit at that time? For a long time the story was that this was no ordinary run on banks on the part of the general public but rather a question of huge withdrawals on the part of a very few depositors.

In his treatment of the second world war Kemmerer devotes considerable space to military and diplomatic events (pp. 464-67) but leaves a curious void as far as mobilization of the economy for war is concerned. Production simply increased "miraculously," and prices simply failed to rise as rapidly during the war as they did in the years immediately following. I wonder whether we appreciate how much the various wartime controls saved us in lives and resources, and whether we can afford to forget the experience.

Space does not permit listing all the parts of this volume which are extremely well written (such as the chapters on agriculture) or all the items which require revision (such as the apparent confusion between Santo Domingo and Haiti on page 282). For the most part it is a solid book indeed and leaves the reader with a feeling that he has learned more than he expects from a college text.

THOMAS SENIOR BERRY

University of Richmond

Statistical Methods; Econometrics; Social Accounting

State Income Differentials, 1919-1954. By FRANK A. HANNA. Durham, N.C.: Duke University Press, 1959. Pp. xix, 268. $7.50.

This is the final report of a study of differences in per capita state incomes carried on at Duke and financed in part by grants from the Rockefeller and Ford foundations. The chapters fall into three groups. One deals with relative changes in state incomes over time; the second with differences in the economic activity and income patterns of the various states. A final chapter discusses demographic aspects of state differentials. Two significant appendices deal with problems of statistical analysis encountered in the report—regression and standardization procedures. A third appendix reports new statistical data on per capita farm income and per capita components by states, 1929 to 1954. All this is preceded by an introduction and summary, especially valuable for the reader who is more interested in the findings of the analysis than in the technical aspects of the methods by which the findings are derived.

Chapters 2 and 3 deal with secular and cyclical changes in state income differentials, 1919-1921 and 1929-54. Most striking is the narrowing of interstate income differences over the years, as measured by the coefficient of variation. At the beginning of the period the state coefficients were in the range 37-41 per cent. Since 1954, they have narrowed to 21-24 per cent.

The chapter on cyclical behavior is one of the most interesting and suggestive parts of this report. The author discusses fully and clearly the difficulties of isolating cyclical and secular elements of income behavior during a period marked by the distortions of major depression, inflation, and war. He employs sensitivity and time-factor indices for his analysis. He concludes from his comparison of these two indices that approximately two-thirds of the decrease in interstate dispersion, 1932-34 to 1952-54, is associated with factors related to the sensitivity indexes and about one-third to elements associated with time. Since the chief obstacle to the isolation of cyclical patterns and secular trends in the data is the erratic behavior of farm income, sensitivity and time-factor indexes have been calculated separately for per capita farm and nonfarm incomes. Because of this difficulty and others of a more technical nature it is impracticable to summarize the findings of this chapter with the brevity required of a review. However, the interested reader will find a close study of Hanna's analysis rewarding.

Chapters 5 and 6 deal with differences in occupational and industrial earnings by states. However, this reviewer finds Hanna's statistical analysis questionable and his conclusions puzzling. The statistical problem and the author's approch to it may be described as follows: Average state per capita earnings by occupation are the end-result of a totality of area and interareal economic forces. Among these, three factors are surely important: the occupation pattern, the interoccupational distribution of skills, and the hourly or weekly rate of pay. Given only the crude data, is it possible to isolate the effects of each of these three variables from the total average per capita earnings by statistical methods? The affirmative answer of this report is expressed in this quotation from the summary (p. 17):

> A state which has relatively more of its experienced labor force engaged in the higher-paid occupations would be expected to have a higher average earning. To obtain a measure of the state average earning that would be expected if occupation composition were the only difference among states, there has been computed for each state an earning figure which is based on the national rates for each occupation and the State's occupational distribution of its experienced labor force. Since identical occupational earning rates have been used for every state—only the occupational composition of the states has been allowed to vary—the computed earning figure is called the state's rate-constant earning. The difference between two states' rate-constant earnings provides a measure of the difference in their occupational compositions.

The author then raises the question of "how much of the observed interstate earning differential is explained by interstate differences in occupational composition" (p. 139). In attempting to answer the question he makes use of the coefficient of determination as a method of measurement. State rate-constant earnings are taken as the independent variable and state reported earnings as the dependent variable. After computing various coefficients for 1949 state occupational earnings he states that: "The coefficient for all wage and salary workers indicates that the interstate variation in occupation composition accounts for about 87 per cent of the interstate variation in reported earnings" (pp. 141-42).

This statement is enough to startle any state planning officer or regional economist who might wish to use Hanna's findings. The reader not deeply versed in methods of statistical analysis surely will feel that this figure is unreasonably high; and he will be even more puzzled by the author's statement on page 142 that the measure is "wholly statistical" and "contains no implication concerning the existence or nonexistence of any causal relationship between the two series"; as well as by the footnote which states that 10 per cent of the total variation is "explained by independent effects of composition," while 77 per cent is explained by other effects correlated with composition.

The technical objections to Hanna's use of and interpretation of the results of the coefficient of determination already have been voiced by all three discussants of Hanna's original paper on this subject presented before the NBER Conference on Research on Income and Wealth held in June, 1955. (*Regional Income, Studies in Income and Wealth,* Vol. 21, Princeton 1957.) George H. Borts of Brown University objected particularly to the "overestimate of the independent influence of occupation mix on state income differentials." In the reviewer's opinion Hanna's resort to the association of correlated effects with the independent effects of occupational variation is invalid.

Hanna concludes the report with a chapter on demographic factors. He sees such factors as sometimes reflecting occupational and industrial income differentials, and sometimes acting independently to help explain the existence of these income differentials. Five are selected for special study. Three are age groupings; the other two are labor-force participation, and size of the employed labor force. Analysis of the data shows that lower per capita incomes tend to be associated with larger percentages of state population in the younger age groups, and with smaller percentages of population in the labor

force. However, the abstraction of such age and labor force participation factors still leaves a substantial proportion of interstate differentials to be explained by other factors, some of which may be demographic. Hanna suggests several such demographic factors, including time spent in schools, gainful employment of women outside the home, etc.

Finally in deference to the many students of metropolitan regions, Hanna examines the relation of city size to state income differentials. He concludes that other demographic factors are likely to be much more important than city size in explaining income differentials among states, and that city size is not a very useful framework for such analysis.

This book adds to our knowledge of the behavior of state income differentials among the states since 1929, but its contribution is limited because of its emphasis upon statistical explanations of these differences, and because of the author's failure to inquire into the fundamental economic and intsitutional factors which underlie the data.

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Obshchestvennyi produkt i ego struktura pri sotsializme. (Social Product and its Structure under Socialism.) By YA. A. KRONROD. Moscow: Gospolitizdat, 1958. Pp. 554. Rbl. 11.

This book, by a leading member of the Institute of Economics of the USSR Academy of Sciences, is a comprehensive treatise, from the Marxist standpoint, on the structure and dynamics of the national product. Primarily theoretical rather than empirical, it is concerned chiefly with an elaboration of Marxist theory on this subject and its application to a socialist economic system such as that of the USSR. The structure and growth of Soviet national product, however, receive substantial, if secondary, attention. Although much statistical information is presented on the Soviet economy, little of it is new. The book is scholarly both in format and in tone. In contrast to most Soviet economic monographs, it has both a subject index and an index of authors cited. There are many footnote references to other works and to sources of statistics used, although sources are not given for all figures cited. The author's manipulations and adjustments of published data are in most cases fully explained. Although Kronrod frequently asserts the superiority of Soviet socialism over capitalism and of Marxist over "bourgeois" political economy, his approach is expository rather than polemic, and "bourgeois" economists are cited without being denounced.

The book's "investigation of the laws of socialist expanded reproduction of social product and of the development of its economic proportions" consists of seven long chapters. In the first chapter, Kronrod analyzes the Marxist concept of "social product," stressing the meaning of material production and the difference between social product, or total gross material production, and national income, or total net material production. In the next chapter, he examines various aspects of national wealth and various ways of classifying economic activity. Chapter 3 is concerned with an explanation and justification of the "law" of preferential development (i.e., more rapid growth) of the means of production compared with the means of consumption. Chapter 4

deals with the characteristics of industrial and agricultural production and their role in the social product. In Chapter 5 the concepts of constant capital, variable capital, and surplus value used by Marx in his analysis of capitalist production are adapted to the conditions of a socialist society and designated, respectively, the "fund for replacement of fixed and working capital," the "fund of production for oneself," and the "fund of surplus product." The sum of the latter two constitutes net production or national income, which is devoted in part to consumption (personal and collective) and in part to accumulation. Chapter 6 analyzes the two components of the replacement fund, while Chapter 7 deals with the accumulation and consumption "funds."

Most Western students of socialism and of the Soviet economy are likely to find Kronrod's very detailed elaboration of Marxist doctrine—which builds on and extends his earlier work[1] as well as that of other Soviet writers, such as Notkin and Kolganov—of less interest than his remarks on various aspects of Soviet economic development and economic policy.

In his explanation of the need for higher rates of growth of production of producers' than of consumers' goods, Kronrod distinguishes six major reasons for this policy in the USSR: mechanization and automation in industry; introduction of new technology; concentration of production in larger, more specialized plants; investment in production, transportation, and housing and other ancillary facilities in connection with the development of Siberia and Central Asia; development of agriculture through mechanization, electrification, and provision of chemical fertilizers; and production of equipment for consumers' goods industries.

Kronrod is critical of Soviet price policy, pointing out that the shares of the different sectors in aggregate social product are inaccurately represented because of the pricing of producers' goods "below their value." (However, he says, because of "a compensatory deviation of prices above their value" in the case of consumers' goods, the total value of the social product is nevertheless correctly stated.) Among other undesirable consequences of the underpricing of producers' goods are the understatement of materials costs relative to labor costs, "artificial losses" for some producers, and the inability to compare the "effectiveness" of investment in different branches of industry and sectors of the economy.

Kronrod also criticizes Soviet policy on amortization allowances as being unsuited to conditions of rapid technological progress because these allowances are based on original rather than reproduction cost and on expected physical life, without recognition of the likelihood of obsolescence.

In his discussion of capital-output ratios, Kronrod cites with respect the work of Goldsmith, Kuznets, Domar, and others. He concludes that the capital-output ratio in the USSR is declining, primarily because recent technological progress has reduced capital requirements per unit of output and secondarily because of increasing efficiency in the use of the capital stock.

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[1] For example, *Sotsialisticheskoe vosproizvodstvo* (Socialist Reproduction), Moscow 1955.

Economic Systems; Planning and Reform; Cooperation

Instrumente und Probleme westlicher und sowjetischer Wirtschaftslenkung. By GÜNTER HEDTKAMP. Giessen: Wilhelm Schmitz, 1958. Pp. 187. DM 14.80.

In this study the author compares the problems and objectives of economic policy-making and implementation in the West with the formulation and execution of the Soviet national plan.

The work, which is well organized, consists of two main parts. Part I presents a brief, yet critical, survey of Western social accounting and of the history, development, and present form of the Soviet national plan. The second part deals with the actual problems of carrying out economic policy in the countries of the West and economic planning in Russia.

It is, of course, the second part which is by far the more interesting. In it, Hedtkamp draws attention to the failure, thus far, of Russian economists to develop a comprehensive theory of central planning. He attempts, therefore, to reconstruct, so to speak, from the existing practical instruments and given preconditions the planning methods actually in use in Russia today. Thus, Hedtkamp finds that "contrary to the Soviet thesis, . . . the production program is more and more determined by private consumption" as average income rises. Consequently he discerns a tendency for more subtle, "indirect" policy measures to replace the fiat of the economic planners. This would amount to some narrowing of the differences between Soviet economic planning and traditional Western policy methods. It would also lend new importance to Russian fiscal and monetary policies.

Hedtkamp's work is based on sufficiently recent material to be able to take account of Khrushchev's decentralization policy, first announced before the Supreme Soviet in 1957. His documentation is impressive: it has obviously been assembled with great thoroughness and includes material published in Germany, Russia, France, and England, and by the United Nations in New York. What one looks for in vain, however, is references to the U.S. literature in this field. Most probably, this omission is not a deliberate one; it seems more likely that it was dictated by the relative accessibility of sources for research. The U.S. scholar who will, in any case, be familiar with the work that has been done in this country will for that reason find the bibliography no less useful.

A word of caution to the prospective U.S. reader of Hedtkamp's book. The language is difficult and interspersed with neologisms which the reader may not be able to find in his dictionary; and the style does not make for particularly easy reading. But then, when it comes to economists who are not masters of literary expression, Hedtkamp is in good company.

The summaries in French and English at the end of the book would be more useful if only the translations were a little better. As it is, it seems unlikely that anyone who has difficulties reading the summary in his own language will take the trouble to attempt reading the entire book in a foreign language.

But these are minor criticisms. The book is competently written, interesting, and well worth reading.

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Systèmes et structures économiques. By ANDRÉ MARCHAL. Paris: Presses Universitaires de France, 1959. Pp. viii, 716. 22.00 NF.

The volume under review is published in *Collection "Thémis"* which specializes in providing textbooks for students working for degrees or certificates under the revised and extended program in the social sciences initiated by the Decree of March 27, 1954. André Marchal, professor in the Faculté de Droit et des Sciences Économiques, University of Paris, has been in charge of the course on Economic Systems and Structures since its inauguration in 1954-1955. It was at first an elective one-semester course for third-year students, but became eventually a yearly course obligatory for all fourth-year students in economics. *Systèmes et structure économiques* is the by-product of Marchal's teaching and is addressed primarily to his students.

The study is divided into four main parts: A general introduction (pp. 1-109) which deals with the notions of structure and system and questions of methodology; Part I (pp. 111-378), Systems and Combinations of Structures; Part II (pp. 379-597), Dynamics of Systems and Plasticity of Structures; and Conclusions (pp. 598-691), The Acceptance (*prise en considération*) of Structures and Systems by Contemporary Economic Theory and Policy. Each of the four main divisions is subdivided into titles (*titres*), chapters, sections, paragraphs and smaller entities designated by letters and Roman numerals—an elaborate and forbidding scheme of organization.

Marchal deplores the estrangement between economic history and economic theory and believes that their integration is attainable by using the notions of structures, systems, and "types of organization," especially as developed in the writings of Johan Åkerman and Walter Eucken. The author has a great deal to say about structures and systems which he examines in their static and dynamic aspects. A structure, in the latter sense, is defined as "elements of an economic entity [*ensemble*] which during a specified period appear as relatively stable while compared with others"; and "when the various structures which make the entity under consideration are mutually 'coherent'—coherence emanating [*naissant*] from the internal forces which unite the structures and also from the common internal and external obstacles to which they oppose a concerted or spontaneously synchronized reaction—we are in presence of a 'system,' while the absence of coherence revealed by observation shows that one is faced not with a 'system' . . . but with a 'regime.' " These and similar concepts and definitions may well appear somewhat labored and arbitrary and are not easy to grasp or use effectively.

Marchal's theoretical generalizations are the weaker part of his study. He quotes numerous European writers on economics and sociology whose names mean little to Anglo-Saxon readers. His reasons for selecting American authorities are not always obvious. He devotes, for instance, several pages to a summary of the classification of countries according to the state of their bal-

ance of payments offered by Boggs (neither his first and middle names, Theodore Harding, nor his initials are given) in a volume, *International Trade Balance*, published in 1922 (in Marchal's bibliography the date of publication is listed as 1929), that is, at a time when the study of the balance of payments as a major public issue was still in its infancy. In the section on business cycles no reference is made to the works of Wesley C. Mitchell and the publications of the National Bureau of Economic Research.

The descriptive part of the book presents much interesting and valuable material on capitalism, corporativism, and collectivism, and their evolution. The section on the contemporary French economy is particularly enlightening and useful. Inevitably Marchal is concerned chiefly with change. His conservative-minded readers, however, will find comfort in Montesquieu's dictum which the author quotes: "Such is the nature of things that wrong-doing [*abus*] is quite often preferable to redress [*correction*], or at least that the good [*le bien*] which exists is always preferable to the better [*au mieux*] which does not."

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Business Fluctuations

American Business Cycles 1865-1897. By RENDIGS FELS. Chapel Hill: University of North Carolina Press, 1959. Pp. vii, 244. $6.00.

Professor Fels has presented us with a theoretically informed and—within the limits set by the published quantitative data—a carefully documented analytic history of United States business cycles during the last third of the nineteenth century. The successive business cycles during 1865-97 are examined as historical individuals in Chapters 6-11. In Chapter 5 the author deals with the entire period as an historical unit and weighs the evidence concerning the competing "real" and "monetary" explanations offered in the literature for the coexistence of secularly falling prices and a series of unusually severe business depressions. Similarly, in Chapter 12 he treats the submerged business cycle of 1894-97 as part of "The Depression of the Nineties" (1893-97) and enquires into the causes of the latter. The first four chapters of the work are devoted to methodological issues and the elaboration of a theoretical framework for the historical investigations; and a final chapter summarizes the conclusions of the entire study.

The author has approached his topic as a specialist in business cycles, concerned with the light which nineteenth-century experience may cast on the nature of business cycles. Now, a principal feature of the historical approach is that it treats each cycle as a unique individual, and among other things this means giving explicit attention to exogenous factors. On this score, Fels concludes that external events were important but mattered less than internal forces (p. 221). This judgment is heavily qualified for the "depression of the nineties," however, when the silver problem was "the real villain of the piece . . . without which the contraction of 1896 would have been mild and the con-

traction of 1893-94 little worse than 1882-85" (p. 218). If this interpretation of the 1890's is correct, it reduces from three to two (1870's and 1930's) the number of observed depressions since the Civil War which *could* have been both deep and prolonged because of the operation of internal forces alone. Moreover, though the contraction of 1873-79 was prolonged and was marked by severe price deflation, it was "singularly mild" in terms of output, and the extent of unemployment was grossly exaggerated in some contemporary reports (pp. 107-08). These are significant findings for anyone who is interested in the frequency and causes of catastrophic depressions and the likelihood of their recurrence.

Historical studies may also be used to test cycle theories. This endeavor occupies much of Fels' attention. He uses Schumpeter (innovations and the process of adaption to them), Gordon (creation and exploitation of investment opportunities), and Hicks (multiplier-accelerator models) as representative examples of important theoretical schools. The respective theories are regarded as essentially complementary, but there is nonetheless an attempt to judge which is the most consistently rewarding as an explanatory hypothesis for the business cycles of the period. The first, second and third prizes are awarded in the order listed above. The issues are complex, and I have far too little space to do justice to Fels' views on these matters. I can do little more than suggest some reservations to be kept in mind by the reader when he is assessing Fels' conclusions.

The low score for Hicks' theory is partly because it is a poor construct for empirical interpretation or testing and partly because it is really several theories. As Fels observes, the distinctive feature of Hicks' theory ". . . is stress on the acceleration principle. It is exceedingly difficult to get convincing evidence on the acceleration principle, so that the negative results in this instance are not decisive" (p. 224). The theory was found wanting, not because it was necessarily inconsistent with experience but because its basic mechanism did not provide a useful tool for empirical research of the historical variety. On the question of consistency with experience, moreover, Hicks' theory is eclectic and has enough variants to fit almost any case. For example, monetary ceilings were encountered in 1873, 1890, and 1893 even if real ceilings were not, and Hicks has allowed for this possibility. Furthermore, Hicks believes that catastrophic depression is the result of profound monetary instability and would not occur from the real accelerator mechanism alone. In short, whether Hicks' theory is even broadly consistent with experience depends considerably on which of its variants one has in mind.

Fels believes that a modified Schumpeterian theory provides the best single explanation of the cycles of the period 1865-97. Gordon's theory includes innovation as one source of investment opportunities, but Schumpeter places it in the center of the stage and also analyzes the "competing-down" process by which the new displaces the old. Even more attractive to Fels, one suspects, is the unity given to the separate Juglars of the period by the hypothesis that they belong to a single Kondratieff recession—that of the railroad era. But as Fels himself shows in his chapter on the "long-wave depression," that same unity can be imparted as readily by an hypothesis of inadequate growth rates

of autonomous investment opportunities, the money supply, or both. And Fels has introduced no evidence that the distinctive feature of Schumpeterian recession—the competing-down process as the fruits of past innovations and the investment opportunities they induced elsewhere are harvested—really applies to a thirty-year period even in response to a major innovation like railroad transportation. Isard's schema of a twenty-year transport-building cycle makes use of the same central idea and has more statistical support, but twenty-year cycles are neglected in Fels' work.

The author has little to say about the extent to which his "basically Schumpeterian" explanation of the post-Civil War nineteenth century business cycles applies to the present-day economy, and rightly so. It was Schumpeter's own opinion "that the darkest hues of cyclical depressions and most of the facts that make of business cycles a bogey for all classes are not essential to business cycles per se but are due to adventitious circumstances." Even if it were granted that the disturbances introduced by innovations are still the first cause of business cycles, one would have to ask to what extent monetary and financial reforms, modern conceptions of contracyclical policy, and other structural changes may have mitigated those "secondary consequences" which were responsible for the darkest hues of depression. More generally, it is certain that the structure of the economy has changed since the nineteenth century and even since the 1920's—both in a qualitative sense and in terms of the values of some of its basic response parameters—and the vital question is how much these changes may have affected cyclical behavior. Fels has not tried to answer this question, but he has provided a scholarly treatment of his period which will be useful to those who would undertake the task.

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Money, Credit and Banking; Monetary Policy; Consumer Finance; Mortgage Credit

Voprosy valiutnogo kursa rublia. (Problems of the Ruble Exchange Rate.) By I. AIZENBERG. Moscow: Gosfinizdat, 1958. Pp. 158.

This is the first Soviet book in at least three decades to deal exclusively with the ruble exchange rate. It is also the only book on Soviet foreign trade since before the war to treat the subject in other than purely descriptive, administrative, or "verbalization of tables" terms and which makes some attempt to grapple with economic problems. Not that this book is without faults—it is repetitious and the analysis leaves much to be desired from a Western point of view.

The book begins with a useful history of the development of the present system of exchange control. While foreign trade came largely under state control immediately after the revolution, until 1926 the ruble (*chervonetz*) was a partially convertible currency supported by the State Bank in Western foreign exchange markets. Beginning in 1926, partly as a result of a large trade deficit the previous year, convertibility was ended, the Bank was given

the exclusive right to hold precious metals and foreign currencies and, with a few exceptions, the export and import of rubles were forbidden. At this point, domestic prices became essentially insulated from foreign trade influences and the exchange rate from balance-of-payments influences. Minor regulations promulgated from 1926 through 1931 completed this process.

An important reason for the controls instituted in 1926 was the fact that the ruble was overvalued. The new controls then, of course, facilitated (in a domestically inflationary situation) the development of further overvaluation. The existence of overvaluation is admitted and discussed at length by the author who says that a 32 per cent devaluation (in 1928) would have made Soviet exports profitable again (p. 74). But devaluation was not yet in the cards, and the overvaluation increased between 1928 and 1936 as world prices fell and Soviet internal prices rose (p. 136). These trends led to a change in the exchange rate of the ruble in 1936 to eliminate the (p. 135) ". . . gap between the level of internal prices of Soviet imports and exports and the prices of these goods on foreign markets. . . ." This is the most candid discussion by a Soviet economist of ruble overvaluation which I have seen. Aizenberg does refuse, however, to admit that the change in the value of the ruble in 1936 can be likened to a "bourgeois devaluation." Bourgeois devaluations, he argues, (1) involve a fall in the standard of living of the workers; (2) lead to a rise in internal prices; and (3) have an impact on the structure of foreign trade (but see below) and balance of payments. Leaving aside the pejoratives, Aizenberg is simply (and correctly) saying, in effect, that under Soviet conditions the foreign exchange ruble is purely an accounting unit and, as such, changes in its rate have no impact on major economic variables. The reason given for the devaluation is the same as that usually offered for the elimination of subsidies: preservation of managerial incentives. This is the one economic variable which *is* affected by an overvalued currency. With an overvalued currency, exports are sold by foreign trade organizations at a large loss relative to domestic cost, thereby necessitating regular subsidies; and imports are bought at a large profit. Under these circumstances, it is difficult to keep managers of foreign trade organizations striving for efficiency and profits. Hence the need for devaluation.

Aizenberg does not deal quite so candidly with the 32 per cent revaluation of 1950. He argues that revaluation was required by the fall in Soviet internal prices from 1947 to 1950 (p. 145). In fact, only consumers' goods prices fell in this period and these goods were not a large part of foreign trade turnover. Despite an 18 per cent drop in 1950, for the whole period 1947-50 producers' goods prices roughly doubled. It can be demonstrated that at the time of the revaluation, Soviet internal prices of both consumers' and producers' goods were higher than world prices and that the revaluation increased the degree of overvaluation.[1] If anything, devaluation was in order in 1950.

In his final summing up, Aizenberg argues that two ruble exchange rates are presently necessary: one for tourists and embassy representatives which equates consumers' goods prices with those of other nations; the other for

[1] My own estimate is that internal producers' goods prices were 40 per cent higher than export unit values in 1950, before revaluation and after the internal 1950 price cut.

producers' goods and raw materials. (This is, in fact, the case.) He admits, contrary to an earlier opinion cited above, that an appropriate exchange rate has considerable significance in planning the volume and structure of foreign trade turnover in the USSR and in defining the "economic effectiveness" of exports and imports of different commodities. My feeling is that this admission is unnecessary, or at least overstated. If Soviet internal prices were "rational" and only the exchange rate were out of line, it would be a relatively simple matter for the planners to appropriately discount the overvaluation of the exchange rate. It is the general irrationality of relative prices which primarily complicates the rational planning of Soviet foreign trade.

Most of the book is concerned in one way or another with the above issues. There is also discussion of other matters, however, such as the balance of payments and the interrelationship between Soviet prices and the value of gold. Finally, Aizenberg presents some percentage figures which enable us to calculate firm figures of 3.9 and 4.5 million fine ounces, respectively, for Soviet gold production in 1934 and 1935.

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International Economics

Essays in World Economics. By J. R. HICKS. Oxford, Eng.: Clarendon Press, 1959. Pp. 274. $4.20.

It comes as something of a surprise to one who has been observing the American economy carefully for the past decade or so to learn that the United States and Canada were characterized during this period by "the combination of rising wages with stable prices." To John R. Hicks, whose opinion we have come to respect in so many areas, this situation was "in itself a thing that is extremely pleasing."

Our confidence in his judgment does get something of a blow from his statement that this stability was not the result of keeping the average level of prices stable "while particular prices would be changing, some rising, some falling, in such a way as to keep demands and supplies in a moving equilibrium." What is more, it is not probably true that our idyllic situation was due to the "choice . . . and the exercise of its powers by the monetary authority, with such perfect skill that it got its objective exactly right."

What actually was happening in the North American economies was a steady rise in productivity and a wage drift. The rise in wages did not communicate itself to higher prices. In fact, says Hicks in his essay entitled "A World Inflation?", a rise in wages under these conditions "does not in itself push costs up, but it does (in large measure) prevent them from falling." In due time, of course, when the wages in some, at least, of the industries which have not shared in the productivity gains are brought into line "prices must rise." But this is yet to come.

This extraordinary estimate of North American experience deserves at least a respectful hearing. Part of our own confusion on the subject of inflation—

and if you can think of a better word than confusion, please supply it here—may be traced to the obvious fact that there was political fat in the fire. Although it shouldn't have mattered to the analysis, the position the observer took with respect to the nature of the dangers of inflation determined how he viewed the facts. It is possible that there never really was an inflation during this period at all. That this estimate knocks all the arguments over demand-pull and cost-push and monetary policy into a cocked hat is something of a shame, to be sure, but here is a chance to see ourselves as others see us.

The United States and Canada belong, according to Hicks, in category A, "countries with a moderate price rise." In category B, where the United Kingdom is to be found, are those nations which have known a mild postwar inflation. To explain their situation, Hicks unlimbers the best of his artillery of analysis.

Demand-pull, he feels, does not give a complete picture of the British situation, though both for Britain and Germany demand has been excessive in the 1950's "whether that excess demand has arisen from the profitability of exports or from some other cause." Rather it is to the labor market that we must look to see the complete picture. In the modern economy, this market is crucial to an understanding of the adjustment process.

The cost-push of labor, however, can not be interpreted properly without a clearer view of the cost-of-living reaction, which is in turn traceable—in significant degree—to the cost of imported consumer goods. Working in this way, the cost-of-living mechanism "tends to move internal prices into line with external prices, but it does not, in itself, push them above."

"The general characteristic" of the B countries' experience "is that there has been a rise in their prices, relatively to those in the A countries; and yet they have been able to maintain their exchange rates." This, to be sure, is inflation, but by no means "scandalous"; for this inflation is "really a special problem of post-war recovery spun out into the years of apparent normality."

All this reasoning is not only cast in terms of the European context—more particularly British—but also in the context of what Hicks calls the labor standard, which, in his view, has since the 1930's replaced the gold standard. In his essay "Economic Foundations of Wage Policy" he tries to make it quite clear that he regards "the Labour Standard as an unquestionable benefit" but there are "a number of defects" among which is the fact that "while the Gold Standard was an international standard, the Labour Standard is national." Thus, it follows that the value of money in terms of wages undergoes "no deliberate determination. It is a mere by-product of the wage fixing process."

But in this wage-fixing process, unlike the view taken of it by many authorities, it is not the cost of living—at least operating internally—which need cause any rise in wages. These rises are traceable directly to rises in productivity. Nor can we, except temporarily, seek a determining cause in the structure of wage differentials though these may play some part in scarcity of labor here and there. Nor finally can we find the recent wage rises to be traceable to profits. In short, "the continual rise in money wages since 1945

is not a necessary consequence of Full Employment (or of the Labour Standard)."

The external influences, proceeding as they do from changing rates of productivity particularly in North America, however, are vital to an understanding of the world inflationary process. The rate of economic growth has been so much faster in the United States and the dollar area in general than in the nondollar area that we have tended to overlook the fact that a growing bias is being built into the imports and exports of the dollar area.

The key is the slowdown in the rate of growth of agricultural productivity —or what is the same thing from an international point of view the failure to pass on the results of such improvements because of the operation of farm price-support policies—which has made the dollar area less able to export its traditional wheat, cotton, and so on. This has tended to force wage-goods costs up in the nondollar area and transmit inflation to the B countries.

It is to be observed however that those nations most closely tied to the dollar countries—e.g., Latin America—have suffered the most inflation in the postwar period. Part of this "must no doubt be attributed to the unfortunate system of multiple exchange rates" but to a greater extent the blame must be found in the peculiarities of the dollar market. Put directly, terms of trade within this market have been turning sharply against agriculture and primary products in general both within and outside the United States—see the falling parity index as an evidence of this—but overseas producers have not had available the largess of a Congress willing to stockpile agricultural surpluses to fall back on. On the other hand, they had been led by a series of very good years right after the war to make spending plans in anticipations of more normal times. "Such anticipations were asking to be cheated . . . and though the crisis was not *caused* by a fall in export earnings, its consequences were only too likely to be the same as those which had traditionally occurred in that event."

Thus in calm and extremely finely spun analysis, Hicks presents a case which emerges as one of the most powerful condemnations of our national economic policies that has yet appeared. He would be the first to deny that this was the purpose of this volume on world economics, but I think he would insist, as he says in another connection in this volume, "the analysis which emerges does not sound to me so unrealistic. It sounds to me like ringing true."

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International Financial Transactions and Business Cycles. By OSKAR MORGENSTERN. National Bureau of Economic Research Study. Princeton: Princeton University Press, 1959. Pp. xxvi, 591. $12.00.

There are some books that cannot be reviewed adequately after one reading, however careful. Professor Morgenstern's *International Financial Transactions and Business Cycles* is obviously in this category. The wealth of material, the new insights into the international financial system, particularly as it operated in the forty years before the first world war, and the many questions

raised are all worthy of repeated study. It will surely be years before students and practitioners in international finance catch up with the full implications of this book; though it would be most unfortunate if the views which have been and still are current on the behavior of interest rates, long-term as well as short-term, the interrelations between interest rates in major money and capital markets, the impact on international financial operations of exchange rate variations and their relation to interest rate developments were not to be reconsidered in the light of Morgenstern's penetrating analysis. Interest rates and exchange rates and their interdependence are the relatively narrow focal point of his investigation, reflecting the importance he attaches to monetary phenomena in the international aspects of business cycles but also reflecting the importance he attaches to careful investigation. A broader focal point would necessitate a less rigorous analysis.

The progress recently made by the Western European countries in establishing currency convertibility means that the questions posed by Morgenstern have great current importance for policy formation. An international financial system has again been established in which major money markets, particularly London and New York, are also major foreign exchange markets where all the forces affecting the world demand and supply of various currencies are felt. Demand and supply in these markets is still importantly affected by governmental restrictions on trade and financial transactions; but to a rather startling degree and in a manner unexpected even to some who have followed these matters very closely during recent years, the international financial system now encompasses and reflects the actions of individuals and firms rather than of governments. Freedom to move funds, together with the general conviction that this freedom will continue and that the exchange rates (or par values agreed upon with the International Monetary Fund) will remain stable within narrow limits, means that we are again in a world where interest rate differentials, variations in income-earning possibilities in various countries, small relative changes in exchange rates, subtle changes in expectations in these fields, are of prime importance.

Morgenstern's analysis sets forth how these factors operated before 1914 and between the two world wars and attempts to give some explanation for the differences between the observed behavior and what might have been theoretically expected. He does not deal with the conditions following the second world war. When the book was published, it might have been regarded as essentially of historical interest with important theoretical implications. The change in international financial relations in recent years makes it germane to any analysis of present and future developments and policies affecting the existing international monetary system.

The international monetary system into which we are now moving, with its emphasis on freedom from current restrictions and its internationally agreed par values, made feasible by international collaboration, is centered in the International Monetary Fund. This system draws much of its inspiration from the experience with the international gold standard. It is an attempt to get the benefits of that system in a way compatible with the purposes set forth in Article I of the Fund Agreement, including the expansion and

balanced growth of world trade, the maintenance of high levels of employment and income, and the development of the productive resources of all members. This is something new, and yet it contains much that is old and tested. A correct reading of the history of past international financial systems will greatly enhance the likelihood of proper policies being pursued in the future. Morgenstern has made a major contribution to this, particularly because he has stressed the presentation of facts in an orderly and responsible manner so that it is always clear what are the pitfalls in various possible interpretations of the data. His method of analysis and presentation is such that others can look for parallels or differences from current and future developments in international financial relations and thus help shed light on these matters. Once the relevancy of his material for present conditions is appreciated, it will obviously be useful to compile similar data on the present period.

A summary of the contents of this book, such as Morgenstern has himself attempted in the final chapter, cannot be an adequate substitute for a careful reading of the book, even for those whose main interests lie outside the details of Morgenstern's analysis. Much of the value of the book, and I suspect eventually its greatest influence, comes from the massive data which have been collected, the careful, even meticulous, scrutiny of these data, the method of analysis, the suggestions, implicit and explicit, for new studies, both current and historical. None of these things can be adequately summarized, but a few of the many interesting points and conclusions may be listed.

Noteworthy is the erratic behavior of financial operations in the period between the two world wars. Cyclical developments in the United States, the United Kingdom, France and Germany during that period affected financial developments and policies in a manner defying generalization sufficiently precise for policy formulation. A study of the interwar period is interesting in order to know what not to do today (e.g., the maintenance of appreciably over-valued exchange rates, the belief prevalent in the 1930's that currency manipulation can accelerate lasting growth or offset wrong domestic policies or inadequate savings and resources, the repeated attempts in the major countries to conduct interest rate policies as though other countries did not exist, the frequent but rather misleading assumption for policy formations that the "closed economy" is anything but a convenient simplification). On the other hand, the author's detailed account of the pre-1914 period sheds light on what we might have to do to maintain the aborning international financial system, e.g., the importance of not underestimating the important significance of relatively small differences when judging the need for interest rate changes or considering appropriate timing and the need to watch carefully the interacting autonomous and international influences affecting money and capital markets, while recognizing how difficult it is to evaluate them accurately.

Another interesting conclusion of Morgenstern's book is that financial markets interact more intensively in times of stress and great activity than in relatively quiet periods. The degree of "dependence" of one market on another changes from time to time (and by no means always in the same direction). A most interesting measurement device, the "effort" series, has

been devised to measure this sensitivity on the basis of empirical data, and Chapter 6 which explains this series merits specially close study. The data clearly reflect how difficult it is not only to predict what market reactions will be to financial changes but also how difficult it is even to know and understand what is actually happening. The psychological factors involved are complex and of constantly varying strength.

Morgenstern points out in painstaking detail how the actual operations of the gold standard differed from the usual theoretical expositions of it. For example, arbitrage among free foreign exchange markets is shown to have been quite imperfect—much more than would be reasonable to expect—and exchange rates repeatedly violated the gold parities. His analysis helps to put us on guard against the possible error of misjudging the impact of exchange rate developments today. For example, it seems that the flow of funds in 1959 among the United Kingdom, the United States and Germany did not correspond completely to the existing patterns of exchange rates, spot exchange rates and forward exchange rates. This is no surprise to many who engage in these transactions in the commercial banks or central banks, but the reasons back of this situation are still only vaguely understood outside of these circles.

Morgenstern emphasizes that a theory of the gold standard based on the assumptions that its operation was fully automatic, and that certain financial interreactions among the principal money markets were predictable and complete is inaccurate because the interaction between money markets via exchange rates and interest rates was not nearly as precise and rigid as postulated, even though the gold standard was a monetary system with the greatest amount of freedom for the automatic forces of the various markets. In countries where the gold standard operated, attention was always paid to domestic as well as to the international repercussions of financial policy. They did not always respond quickly or fully to changes abroad; there was a wider margin within which purely national objectives could be pursued, as well as a greater concern for these objectives. The popular strictures against the gold standard are thus in fact frequently against what people said the gold standard was, rather than against what it actually was—an error also to be found in some of the comments made on the international financial system that is now being developed.

Moreover, the proponents of the gold standard frequently concentrated too much on the theoretical essence of the system and neglected its practical operations. The misunderstanding of the gold standard, as the author sees it, is a product of poor analysis of available data, particularly, the failure to submit the acceptable theory to factual investigation, and inadequate data on gold movements, foreign trade, interest rates, and other matters (he rather terrifies the policy-maker who has to operate with such data as are available). He thinks that the theory of games of strategy may help to give a better understanding of financial operations and cyclical behavior. The need for better and more data, a more careful scrutiny of available data, and willingness to look for a new theoretical framework are the burden of Morgenstern's book.

The book merits close and repeated study. Both scholars and policy-makers may well go astray if they neglect it. Students will find in it both the inspiration and building blocks for further useful research. Such research may improve the statistical and analytical bases for a more sophisticated understanding and therefore enhance the likelihood of a successful management of our new international monetary system.

IRVING S. FRIEDMAN

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The European Common Market & Its Meaning to the United States. A Statement by the Committee for Economic Development, Research and Policy Committee. New York: McGraw-Hill, 1959. Pp. 152. $4.75.

For some years the Committee for Economic Development has been enlivening the literature of economic policy with well-argued and well-written statements on a wide range of issues. Some of these papers contain detailed programs susceptible of fairly direct translation into legislation or administrative action. Others emphasize the broad features of a problem and stress the general direction of U.S. policy. Because it is one of the latter type, the statement on the European Common Market remains interesting and relevant even though conditions have changed considerably since it was published in May 1959. Then the negotiations for a free trade area had broken down but the Outer Seven had not yet organized their "little free trade area." When the report was written, United States policy toward the linking of the Common Market with the rest of the Western European economy was notable chiefly for its reticence. Since then the American initiatives of December 1959 have led to the creation of a committee in which the United States and Canada sit with representatives of the two European groups to discuss problems of trade. But at the moment this review is written (February 1960) it is still unclear what the next steps in Europe will be, how far the United States will go and even what direction American policy will take. On these matters the CED report has something to say.

Those familiar with committee-born documents will detect some of the marks of the draftsman reconciling divergent views, such as the seesaw of pros and cons, the caudal proviso to conclusions, and the occasional slight haze that conceals precise lines but not large shapes. On the central policy issues, however, the report is explicit enough. It expresses confidence that the European Economic Community will "increase the efficiency and raise the income of its area." Whether repercussoins in the rest of the world will lead to more liberalization or toward further fragmentation "depends upon decisions still to be made. . . ." The report stresses the advantages of widening the area of freer trade within Europe. It suggests a number of ways of doing this and, without coming down flatly for one, expresses a preference for the retention of "many of the key trade liberalizing features of the Free Trade Area idea." The report rejects the view that the Six will be politically weakened by such a step. The United States, it argues, should accept the wider area of discrimination be-

cause such an arrangement would strengthen forces making for a lower level of preference. These arguments are still as pertinent to policy as they were when the report was published.

The same is true of one of the strongest and most striking features of the CED report, its emphasis on U.S. policy. In part, this is a matter of tariff bargaining to hold down the level of the Community's outside tariff and of insuring that regional economic agreements conform to GATT. But the main emphasis of the CED conclusion is more general. On the one hand, the future character of the Common Market and a possible Free Trade Area will depend to an important degree on the kind of world economy into which they fit. On the other hand, what Europe and the United States do is of tremendous importance to the economy of the rest of the world. To offer the underdeveloped countries opportunities in a liberal and thriving free world economy is at once to assure them of protection against possible damage from the consolidation of a major part of the European economy and to reduce the pressures on them making for protectionism, whether national or regional.

The CED volume also includes a report by the Comité Européen pour le Progrès Economique et Social (CEPES), a group of French, German, and Italian businessmen. After discussing the relation between economic cooperation and political solidarity, this report devotes a chapter to disparities in income and productivity within the European Economic Community and the problems of internal development it faces. The CEPES report suggests that a reorganized OEEC might provide the means of negotiating a settlement between the Six and the other countries of Europe. It raises the possibility of using tariff quotas as a means of cushioning adjustments during the process of trade liberalization.

A summary of the Common Market Treaty and of the relevant passages in GATT, a substantial statistical appendix, and a number of interesting charts and maps make this volume a substantial introduction to Common Market problems as well as an interesting contribution to a continuing debate.

WILLIAM DIEBOLD, JR.

Council on Foreign Relations

Economic Integration: Theoretical Assumptions and Consequences of European Integration. By ROLF F. SANNWÄLD and JACQUES STOHLER. Translated by Herman F. Karreman. Princeton: Princeton University Press, 1959. Pp. xvi, 260. $5.00.

The major emphasis of this book, as its title indicates, is upon a rigorous theoretical exploration of the assumptions, consequences and implications of preferential regional trading areas. A secondary emphasis, in terms of the amount of space devoted to it, involves an argument justifying the establishment of such regional trading arrangements. The authors make little distinction between the Common Market approach and the Free Trade Area, implying that their economic consequences are indistinguishable over time.

While the authors admit global free trade to be preferable to regional free trade, they aver that the former is not feasible in the current world and, there-

fore, irrelevant for analytical purposes. Concurrent with the process of international disintegration since 1914, national integration has occurred in the developed economies. In fact, national integration has been considered a desideratum for economic development. Institutional integration through supranational agencies is a logical extension of this national integration beyond national boundaries and necessarily involves intergovernmental coordination rather than reliance upon a market and price economy. The authors are in disagreement, therefore, with the functional approach to global integration advocated by Röpke and others and embodied in the most-favored-nation principles of the Organization for European Economic Cooperation. The regional integration should be gradual and irreversible.

The chief merit of the book lies in the theoretical analysis which has been distilled from the vast body of existing literature in this field. Those who are not already thoroughly conversant with this material will find this book one that can be read with profit. The discussion is concise, straightforward, and free of pedantry.

The authors rely heavily upon the extensive work of J. E. Meade and accept his concept of maximization of welfare through the optimization of trade and the maximization of production as an underlying premise. In turn they analyze the following theoretical issues concerning the economics of a customs union: trade-creating and trade-diverting effects; internal and external equilibrium problems; common currency; harmonization of social costs; fiscal policy and unique tax problems; and factor mobility. In brief, some of their conclusions are: a customs union need not be trade-diverting but rather, under certain circumstances, may be trade-creating; in the absence of a common currency which is desirable in the long run, variable exchange rates by both surplus countries and deficit countries within the customs union are necessary to bring about external equilibrium through price changes; there is no valid reason for permanent harmonization of social costs by the participating countries. The authors buttress their theoretical analysis with occasional references to the empirical evidence available from the experiences of the European Coal and Steel Community and Benelux. And, lastly, they demonstrate that they are not oblivious to the serious political obstacles implicit in the surrender of sovereignty by national governments.

The book underscores clearly that this is a complex question indeed, and that not enough empirical evidence exists to provide determinate solutions to the questions posed. The economist is forced to state alternative assumptions and, therefore, alternative consequences. He is forced also to consider the political context within which a customs union must evolve. This is why, perhaps wisely, the 1957 Treaty of Rome has left many of the provisions for operational procedure vaguely defined.

There has been a two-year delay in bringing out this book's English translation, and in the interim rapidly moving developments have superseded some of its material. But this time lag in no way diminishes the worth of the excellent theoretical analysis.

THOMAS J. LEARY

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Il mercato comune europeo. By ORLANDO D'ALAURO. Pavia: Prem. Tip. Successori Frat. Fusi, 1959. Pp. 167.

Much of the literary output dealing with the European Common Market has thus far amounted to little more than either a repetition of the economic principles involved (with views of Jacob Viner and J. E. Meade often easily discernible) or to a restatement of what should be done to achieve the purposes of the Market (with minimum indication, however, of *how* to achieve them). Either approach has invited sweeping generalizations.

Professor D'Alauro's book does not quite break with the aforementioned tradition. While it gives evidence of greater realism than found elsewhere, it does not go far enough in its analysis of specific questions and problems. The interested reader can hardly avoid asking: where are the facts with regard to which the expounded free trade principles acquire their full interpretative meaning? Can some empirical evidence be produced to demonstrate the anticipated boon of economic integration?

Although the present volume is devoted to three additional topics (the problem of currency convertibility, national accounting models, and input-output analysis) this review is confined to the principal section in which the Common Market is discussed.

D'Alauro subscribes more or less to the liberalism—and idealism—of the Treaty, seldom questioning, other than implicitly, the economic theory, policy objectives and instrumentalities of the European Economic Community. The author deviates, however, from the conventional thought of the integrationists in one noteworthy respect when he stresses that, in international cooperation, monopoly and cartels sometimes have a positive role to play. Consequently, business combinations should not be rejected simply because they are theoretically objectionable—a pragmatic view which has been held by many Continental economists and businessmen. D'Alauro states further that during the (12-15 year) transition period, producers' (collusive) agreements may be instrumental in promoting Western European integration because they may facilitate rational geographic redistribution of productive activities. Cartel-type organizations may help to avoid the more serious difficulties which are bound to accompany the adjustment processes of both entire industries and individual enterprises. In line with what has in the postwar years been called "reasonable liberalism," the author contends that in most countries the complex problems of the transition period will require substantial political-economic intervention by the State.

D'Alauro also appears to be convinced that these broadly defined forms of State participation should be coordinated internationally (among the Common Market nations). To some extent, he is carried away by the idea that the more one member country resembles another—in terms of economic and financial regulations, and of institutional arrangements in general—the greater the promise of a successful Common Market. His discussion invites the question whether trade takes place between countries which are equally constituted economically (if this were possible, and in Western Europe, conceivable) or between countries which differ as to factor endowment, prices, protective measures, interest rates, fiscal burdens, etc. While harmonization of many

policies will doubtless become indispensable for any success of economic integration, the latter's primary objective is the freeing of goods and factor movements with only incidental concern, in the main, for the development of uniformity of economic and financial policies.

Of the policies whose coordination in the Common Market area is desirable, D'Alauro considers monetary policies of strategic importance for both economic stability in each country and international balance-of-payments adjustment. Significantly, he doubts that monetary cohesion of the area can be attained without some political unification.

The author foresees many problems for each member nation during the transition period. They are connected, for instance, with (1) geographic redistribution of production, in which case there is the danger that some regions (e.g., the Rhine basin) may benefit at the expense of other nations (particularly in Southern Europe); (2) adjustments to be made by individual enterprises; (3) changes in the competitive position of some nations; (4) industrial concentration resulting from standardization and a new pattern of specialization; (5) harmonization of production conditions (in view of prevailing factor price discrepancies); and (6) agricultural integration.

D'Alauro maintains that if the six nations' productive systems were more complementary and less competitive, the objectives of economic integration would be more certain of achievement. (Perhaps this conclusion was drawn from the abortive Franco-Italian Customs Union which was under consideration a decade ago.) While many will agree with him as to the urgent need of "the Six" for investment capital from other nations, few will share his view that the notorious failure of agricultural integration schemes can be solved by eliminating protection of agricultural products and by discarding the already well-established—and in many instances beneficial—government intervention. D'Alauro is quite right in recognizing that the Common Market cannot be exclusive and that cooperation with (at least) all other OEEC nations is as indispensable for all the member nations now as it was prior to 1958. But he does not say how the Market would induce some overhauling of the existing Western European trade pattern—with or without the creation of the Free Trade Area.

Discussions of the Common Market are usually focused on reduction of tariff barriers and on questions pertaining to them. Inadequate attention has been paid to the problem of long-term investment, which our author does little more than identify. If the Market is to bring about accelerated economic growth, most of the six nations will unquestionably need more capital. Where is it to come from? Only a small fraction of the requirement (still undetermined with any meaningful accuracy) is likely to be raised from domestic sources. For various reasons, some obvious, but some dubious, the idea of Western European economic integration has been fostered with the United States serving as an example of a market of continental dimensions. There is little evidence, however, that the integrationists have analyzed the region's potentialities and set targets in complete awareness of the much more plentiful resources which have been at America's disposal. If comparisons were made in other respects than the size of population, number of consumers, steel pro-

duction, etc., some sobering results, and what really counts, the crux of the Western European integration problem would be arrived at.

An aspect of the problem which bears repeating is the fact—often disregarded on this side of the Atlantic, but undisguised on the Continent—that Europe still is "a tangle of interests with some Franco-German understanding at the summit level." Europe is still a continent divided against itself, in which the Common Market is to be developed not only as a customs union but also as a political merger.

D'Alauro's contribution to the study of the European Economic Community is likely to have more weight as an Italian interpretation of the basic provisions of the Treaty of Rome than as an attempt to satisfy the growing need for a realistic appraisal of the Common Market's prospective impact on its member nations and world commerce.

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The Schuman Plan—a Study in Economic Cooperation 1950-1959. By WILLIAM DIEBOLD, JR. New York: Praeger, for the Council on Foreign Relations, 1959. Pp. xvii, 750. $6.50.

Despite its short history, the European Coal and Steel Community has quite possibly been the subject of more scholarly articles and dissertations than any other international treaty or institution. However, Dr. Diebold's book is, to my knowledge, the first to offer a complete, systematic treatment. Anyone who has tried to plow his way through the mass of official and unofficial literature on this subject will appreciate the service the author has performed for future research workers in this field. Diebold has followed the evolution of the Community from its inception, sorting out the facts and analyzing them with sympathetic, yet critical, interest. The result is an authoritative and well-balanced survey which will undoubtedly become a standard reference work.

Part I deals with the historical background of the Schuman Plan and the circumstances and negotiations which led to the treaty establishing the Community. Part II examines the Community's actions to remove tariffs and quantitative restrictions, subsidies, and discrimination in freight rates; the way it faced its problems in the field of cartels, concentrations, and price policies; its work in guiding investments and in providing assistance for the modernization and reconversion of plants and the retraining and resettlement of workers. There is a particularly lucid discussion of the complicated issue which arose at an early stage regarding the treatment of turnover taxes in intracommunity trade—an issue which, for once, was settled neatly and expeditiously by reference to expert opinion (the Tinbergen Committee) rather than by a test of strength or a compromise. Part III describes the Community's relations with the outside world, with particular reference to the United States, and its commitments vis-à-vis GATT.

As Diebold points out, his book is written primarily from the public record; it is not an "inside story." As a result, it only touches on problems which thus far have largely remained the subject of internal discussion within the High Authority, such as compensation schemes designed to protect marginal coal

mines; price collusion in steel; the High Authority's efforts to induce greater price flexibility and to remove special advantages or handicaps resulting from differences in the structure (as distinct from the average level) of taxes, social security systems, transport charges, etc. These problems are only hinted at in the High Authority's annual reports and the full story remains to be written.

The most interesting part of the book is the final section which attempts a broad evaluation of the Community's achievements and prospects. Here Diebold examines the Community's impact on the coal and steel markets, and the "distortions" and tensions created by partial integration. It is here that one might have wished for more rigorous economic reasoning and a more penetrating statistical analysis. The wealth of new data on cost factors, productivity, prices and interregional trade flows compiled by the Statistical Division of the High Authority should now make it possible, for example, to obtain greater insight into the changing relative competitive positions of the different producing areas. To what extent have the effects of integration fallen short of what would be expected in a truly unified market in which trade flows freely in response to economic incentives? What practical consequences have resulted from the fact that partial integration will give a different answer to the question of relative economic advantage than total integration? Do the facts tend to corroborate Scitovsky's expectation that the main effect of integration is to reduce, through increased competition, the range of costs among different plants, within the same country as well as between countries? The author readily admits the need for this kind of close investigation to advance our understanding of what the Community has done and is likely to do. In his analysis, based on cruder indicators, he is careful and circumspect, and his judgment is invariably sound.

Diebold is not taken in by the mystique of the integration movement. He is fully aware of the fact that as of today, the European coal and steel markets are neither unified nor very competitive. He explains the reasons for the continuing price discrepancies, which are far in excess of what would be expected as a result of transportation costs and sales taxes, and some of the factors which impede the adjustment of prices to fluctuations in demand. He rightly focuses on the continuing interference by the national governments as the main obstacle to the achievement of a unified market, and also points to the persistence of "traditional commercial relations" and restrictive business practices among enterprises. He does not expect these impediments to disappear quickly, but he concludes that the Community is solidly entrenched and, most likely, here to stay.

Writing at the beginning of 1959, he saw that the recession, by intensifying competition, was bringing about a greater interpenetration of markets and a gradual convergence of prices; but that it threatened, at the same time, to set in motion all the usual protectionist reflexes, particularly in Europe's ailing coal industry. The book went to press before the resulting strains reached their climax in May 1959 when the Council of Ministers refused to concur with the High Authority's proposal to invoke Article 58 to deal with the "manifest crisis" in the coal industry by imposing production quotas on individual enterprises. As the French Minister of Industry Jeanneney, then president of

the Council of Ministers, explained at a press conference, this was not a matter which governments could leave to the High Authority, as it was not the High Authority which could call out troops to quell disturbances if mines were closed. The problem, which tested the solidarity of the member countries, was ultimately dealt with by a combination of expedients including certain informal restrictions on intracommunity trade which would seem to be inconsistent with the spirit, if not the letter, of the treaty. At the time, the crisis led many observers to predict the impending disappearance of the Community as a supranational institution; but in the historical perspective, it is now evident that this incident (which, with foresight, could have been avoided) has changed little in the character of the Community—where control has always been shared among the High Authority, the governments, and the industries concerned—or in the basically favorable outlook which is the theme of the last chapter of this book.

FRED H. SANDERSON

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Canada in the World Economy. By JOHN A. STOVEL. Cambridge: Harvard University Press, 1959. Pp. xiii, 364. $7.50.

Mr. Stovel has provided a detailed statistical and analytical survey of Canada's balance of payments since confederation. Almost inevitably, however, the focus of his attention is on the tumultuous decade and a half which preceded the first world war. It will be recalled that it was this period which Jacob Viner selected for study in his Harvard doctoral thesis, published in 1924 under the title *Canada's Balance of International Indebtedness, 1900-1913;* and Stovel's book, also based on a Harvard doctoral thesis (of 1949), is a large-scale critical review of Viner's analysis and of the literature inspired by it.

Viner's main purpose was to test the Thornton-Mill-Taussig view of the mechanism by which disturbances to the pattern of international transactions of a country are accommodated. In particular, he sought to "verify" the hypothesis that, under the gold standard, the attempt to transfer capital from one country to another gives rise to the following sequence of events: a rise in the price of bills drawn on the borrowing country; a flow of gold from the lending to the borrowing country, the rate of exchange being at the lending country's gold export point; an increase in prices in the borrowing country, a decrease in the lending country, with the changes being most marked in domestic prices and least marked in import prices; changes in exports and imports, the borrowing country acquiring a passive balance on current account and the lending country acquiring an active balance; after the passive balance of the borrowing country had become exactly equal to the rate of borrowing, the return of the exchange rate to parity, the cessation of gold movements, and the stabilization of relative prices at their new levels. The Canadian experience 1900-1913 was thought by Viner to provide a satisfactory test case since the inflow of capital was not only on a large scale (in some years it was nearly one-quarter of national income), but it was held to be the most significant

disturbing factor impinging on the Canadian economy. Canadian institutional arrangements demanded one minor modification of the classical theory: the New York balances held by the Canadian trading banks took the place of gold reserves.

Viner's analysis of the Canadian episode has long been recognized as a brave and important pioneering work. But reservations concerning the success of his "verification" of the classical theory were entertained right from the start. The objections have been most cogently expressed perhaps in two recent articles by Meier and Ingram and in an unpublished doctoral dissertation of Jacques Parizeau. (G. M. Meier, "Economic Development and the Transfer Mechanism: Canada, 1895-1913," *Canadian Jour. Econ. and Pol. Sci.*, Feb. 1953, *19*, 1-19; J. C. Ingram, "Growth in Capacity and Canada's Balance of Payments," *Am. Econ. Rev.*, Mar. 1957, *47*, 93-104; and Jacques Parizeau, *The Terms of Trade of Canada (1869 to 1952)*, thesis submitted to the University of London, June 1955, esp. pp. 68-87, 227-232.) Parizeau's criticisms relate mainly to the unreliability, incompleteness and inappropriateness of the annual time series deployed by Viner—especially of his import and domestic price series. Meier's and Ingram's criticisms are of wider scope. They relate partly to the incompleteness of the theory to be tested. Bastable, Nicholson and Wicksell had already drawn attention to the shifts in purchasing power associated with a capital movement. Since the shift *conceivably* could bring about the transfer without any gold or price movements, it is difficult to understand how the classical theory could ever be verified. At best, a test could be provided of the proposition that the shifts of purchasing power were, in the period studied, of negligible importance. Finally, objections were raised by Meier and Ingram to Viner's view of the fundamental dynamic of the Canadian economy during the period studied.

Space does not permit a detailed recounting of these objections. It is enough to note that several features of the period 1900-1913 could not have been predicted on the basis of the classical theory and of Viner's view that the import of capital was the dominant disturbing factor impinging on the Canadian economy. Foremost among the unpredictable elements of the situation was the fairly steady increase in exports throughout the period. Next was the steady drift upwards of interest rates. Finally, the order in time of developments was, in some years, in flat contradiction of what might have been expected in the light of the classical theory: borrowing did not always precede the real transfer, and prices had been rising in Canada since 1896, long before the inflow of capital became substantial.

It is always possible, of course, to account for exceptions in terms of "special" circumstances analogous to the *deus ex machina* of the ancient theatre. Thus, in Viner's view, "the increase in the value of the total exports was due almost wholly to the entrance into the exports trade of the products of newly-exploited natural resources, where special factors kept down the costs of production" (Viner, *op. cit.*, p. 274). But evidently one must prefer a theory which can accommodate not only those features of the period which the classical theory is able to account for, but also most of the "exceptional" circumstances.

Such an alternative exists. In its essentials, indeed, it existed at the time of Viner's writing in the lengthy exhibit prepared for the Board of Inquiry into the Cost of Living by R. H. Coats, who later became Dominion Statistician [Board of Inquiry into the Cost of Living, *Report* II (Ottawa 1915)]. The importation of capital took place against the background of a boom generated locally by the expansion of the wheat economy, by the rapid growth of population, by industrialization behind the "National Policy" tariff wall, and by steady urbanization. The boom began in the mid-'nineties, it predated by several years the first substantial inflow of capital, and it provided the profit-incentive for the inflow itself. It also gave rise to a steady increase in prices and interest rates. As a result of the high rate of investment, productive capacity grew rapidly throughout the period; the enlarged capacity combined with falling costs of transportation to produce a steady increase of exports. But exports failed to grow fast enough to completely finance the import requirements of the boom; hence the need for a net inflow of capital. The capital import was effected by the relative expansion of purchasing power in Canada, and by the greater rate of price increase in Canada than in England. I doubt whether, in view of the poverty of the (annual) time series, it will ever be possible to determine with any precision the quantitative role of the several factors involved in this theory.

Stovel's own analysis of the period conforms quite closely to that summarized above. It is a pity that Stovel's book has been so long in appearing, for in the interim many of his best points have been made by Meier, Ingram and Parizeau (to none of whom, incidentally, is reference made). Nevertheless the book is a useful addition to the published literature on the adjustment mechanism. In the first place, it provides a convenient and accurate summary of the debate inspired by Viner's thesis. Second, it supplements Viner, Meier and Ingram in providing a careful analysis of the relation between the Canadian terms of trade and rate of capital import during the period 1895-1913. (Stovel—and Parizeau—reach the not-unexpected conclusion that the relation is not nearly as close as the classical theory would lead one to expect.) Finally, it contains a useful appendix on the sources of Canadian balance-of-payments statistics. (On price series, however, Parizeau's first chapter is more satisfactory. The appendix to that chapter contains a balanced and detailed appraisal of each of the numerous import and export price series which have been constructed for the period since confederation.)

Stovel's use of the available time series is at all times quite informal. Indeed he explicitly eschews formal econometric methods. Further, he himself emphasizes the paucity of the price series. It is surprising, then, to find him confidently asserting (pp. 137, 293), in opposition to some even more vigorous assertions of Viner, that variations of import prices played an insignificant role in the process of adjustment. My own feeling is that the role of prices in accommodating the capital inflow during this period is likely to remain an unresolved mystery.

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Business Finance; Investment and Security Markets; Insurance

Struktur und Funktionsweise des Kapitalmarktes in der Bundesrepublik Deutschland. By WERNER DANNEMANN. Tubingen: J. C. B. Mohr (Paul Siebeck), 1959. Pp. 209. DM 16.00.

The book is a companion to E. Brehmer's previously published study on the West German money market, both having been done at the University of Kiel under the supervision of Erich Schneider. In traditional German manner, the author (who is now with the Bundesbank in Frankfurt) begins with a discussion of all previous definitions of what constitutes the capital market in contrast to the money market and he comes close to concluding that there really is very little difference, as in both markets highly liquid debts are exchanged for less liquid ones, and vice versa.

The second part deals with the interesting experiments of the Bundesbank and the Treasury in guiding the German capital market during the decade of 1949-58. From 1949-52 new security issues had to be approved and interest rates were set by a capital market committee with the purpose of channeling the yet meager flow of savings into uses that might yield relatively low returns but that were considered socially of greatest urgency, especially housing. Industry meanwhile was left to rely on depreciation charges and retained earnings. From 1952-54 the government exercised control of the flow of savings into investments through a more indirect method, by extending tax exemptions to all bonds issued for housing and related municipal works. This measure divided the capital market into two parts, the tax-exempt one with a top yield of 5 per cent, while industrial bonds had to be offered to yield 7-8 per cent and even somewhat higher in order to compete for their share of the supply of savings. With the end of 1954 began the period of a free capital market. Because it was now held that internal financing of business investment, which had been subsidized through very liberal depreciation allowances, had achieved its purpose (of keeping the business demand for savings from competing with social demands) and might even have begun to result in faulty investment, the corporate income tax was split; the rate was set at 45 per cent for retained profits and only 30 per cent for profits paid out as dividends.

The results of these measures appear to have been a fall in the rate of interest between 1957 and 1959 from 8 to 5-5½ per cent for industrial issues, and a sharp advance in the prices of shares during this period, with dividends disbursed greatly exceeding the issuance of new shares.

Following the methods developed by the Bundesbank in its annual calculations of capital formation in West Germany, the author then analyzes the supply of and demand for funds for the years 1950-56. The analysis reveals for these years, as well as for 1957-59, a steady rehabilitation of the private capital market in West Germany. (Capital formation has shifted from being primarily dependent on retained earnings to the channeling of savings by private households into industrial securities. In the government sector investments have held to a steady percentage of total investments but in the foreign sector, there has been a radical change from capital imports to exports.)

The following comments of the author are not borne out by United States experience and may therefore also turn out to be misleading in regard to West German conditions as they approach closer to ours:

> It is categorically stated that the growth of the government's social security arrangements has restricted the desire for and the ability to pay for private insurance and pension schemes (p. 102).
>
> It is held that the reluctance of Germans to invest in stocks is based on the feeling that equities are too speculative. It appears to this writer that this reluctance could be overcome if the par value of stocks would be reduced—the market price of most German shares is in excess of $1000—if dividends were to be paid more than once a year and if the banks were not to charge a fee for retaining customers' shares for safekeeping and collecting the dividends. Most of all, the financial reports of German companies understate earnings, and therefore surplus accounts, to such an extent that only insiders can form a true opinion. Management's right to keep stockholders in the dark had been greatly strengthened under the Nazis since the "leader" principle made managements even more autocratic than they always had been. Some reforms, such as the requirement that sales figures be published, went into effect on January 1, 1960, but a more radical adjustment to United States standards of financial reporting is still under discussion (p. 102).

The author expressed the opinion, widely held in Germany, that the prices of stocks are determined by the annual supply of cash dividends paid vs. the supply of new shares offered, a compartmentalization of the capital market which does not appear justified if a new class of stock buyers should become attracted to equities. Furthermore, he holds that stock prices are determined by dividend yields rather than by growth prospects. Both statements may have had some historical justification in Germany as long as equity holdings were restricted to relatively few "industrial" families, but it will no longer apply when equity-ownership becomes as popular as it is now in the United States.

ROBERT M. WEIDENHAMMER

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Industrial Organization; Government and Business; Industry Studies

Merger Movements in American Industry, 1895-1956. By RALPH L. NELSON. Princeton: Princeton University Press, for the National Bureau of Economic Research, 1959. Pp. xxi, 176. $5.00.

As a welcome addition to the writings of Bain, Markham, and Stigler on merger movements, Professor Ralph Nelson presents a new series of data on mergers in American industry for the period 1895-1920. Had he done no more than present this excellent new series, students of industrial organization would be deeply indebted to him. He, however, also suggestively examines some leading hypotheses, and analyzes the relationship of merger activity to business cycles.

His quarterly series, covering 1895-1920, are broken down into two-digit SIC categories. They list merger activity in a variety of ways: number of consolidations, firm disappearances by consolidation and by acquisition, au-

thorized or estimated capitalizations of mergers. Thus they describe merger activity in both relative and absolute terms. For his analysis of merger activity and business cycles through 1956, Nelson relies on the Thorp and Federal Trade Commission data (1920-1956).

In Burns' data on production trends in the United States Nelson finds no empirical support for Watkins' "retardation thesis." On the contrary, he suggests that merger activity is prevalent in periods of accelerating growth rather than in periods of retardation.

It is with his test (and rejection) of Bain's transportation thesis that I would quarrel, however. He argues that the following conditions must have held if the thesis is valid: (a) the railroad network must have expanded and transportation costs must have decreased in the period preceding the merger movement; (b) a substantial proportion of the mergers must be accounted for by industries with high per-mile transportation costs relative to price of the product; (c) these industries must have had widely dispersed producing centers if the reductions in transportation costs could result in the expansion of market areas; for "if most producers were concentrated in small geographical areas there would be no exclusive local markets for reduced transportation costs to destroy. . . . Thus, on the purely technical grounds of cost minimization, we should expect to find higher geographical concentration in industries with high per-mile transportation costs than in those with lower costs" (pp. 84-85). But do not Nelson's own measurements permit one to cast doubt on this relationship? His simple, unweighted indices of geographic concentration are .510 and .477 for high and low transportation-cost industries—not an impressive difference. Again, on the basis of his reasoning, would not one expect the manufacture of bricks, asphalt, ice cream, and similar local-market products to be highly concentrated?

Furthermore, there is little reference to the qualitative changes in railroad transportation in the latter part of the nineteenth century, e.g., integration of the rail network. And some of the quantitative measurements are unsatisfactory: in measuring real costs of rail freight, Nelson deflates revenue-ton-miles by the BLS Wholesale Price Index, and derives annual rates of change from data for the initial and terminal years of the 1882-1900 and 1900-1916 periods. (Nelson uses the latter period as a basis for comparison because adequate data for the years before 1882 are not available.) But the choice of 1916 as a terminal year (reflecting the beginning of war-induced inflation) is unfortunate because it substantially distorts the measurement of changes in costs. Had the more representative year 1914 been used as a terminal year, the estimate of the average annual change in price levels would have been almost 50 per cent less, and the estimated real costs of freight transportation would have decreased about 2.6 times faster in the pre-1900 period than in the 1900-1914 period. Thus, not only is Nelson's argument open to question, but his choice and interpretation of data also do not warrant rejection of the transportation thesis.

In a few obiter dicta Nelson casts some doubt on such other explanations of merger movements as: economies of scale, the canalizing effect of judicial interpretation of the Sherman Act, and the role of promoters in forming com-

binations. One hopes that further investigation of these explanations will be taken up by other students of merger movements.

A careful and thorough analysis of the cyclical behavior of merger activity emphasizes the close relationship between mergers and capital-market conditions in peak periods; but there Nelson's investigation ends, leaving the issue of financial versus technological and economic factors unresolved, though most suggestively illuminated.

Economists owe Nelson a debt of gratitude for bringing a breath of fresh air into an area smogged in with conflicting and obfuscating generalizations. His book demonstrates once again the value of an empiricism that does more than keep score through time.

JOHN S. DYDO

Vassar College

Imperfect Collusion in the Cement Industry. By SAMUEL M. LOESCHER. Cambridge: Harvard University Press, 1959. Pp. ix, 331. $7.00.

This is an important addition to basing-point literature. Professor Loescher of Indiana University regards geographical formula pricing in the cement industry not as the product of autonomous evolution but as a device developed and improved to create a defensive monopoly, not so much intended to raise prices as to stabilize them. The motivation was the industry's susceptibility to price-cutting due to high overhead costs, economies of scale, ease of entry, excess capacity, and unstable and inelastic demand.

Price stability was to be achieved by minimizing oligopolistic uncertainty "so that all sellers would *know* (author's italics) the competition to be met and could exercise the kind of self-restraint in pricing policy posited by simple oligopoly theory" (p. 84). This was to be accomplished by the use of identical delivered prices on a multiple basing-point system. Freight allowances were standardized by a common freight-rate book. All sales were made on the basis of rail charges and no buyers could get delivery at the mill and provide their own transportation. No special treatment was to be given to large purchasers.

Adherence to this rigid price structure was enforced by the possibility of using a punitive base whereby those wishing to enforce the formula might lower their prices depending upon the offender's base, thus forcing him to lower his price on the bulk of his sales. There also developed a number of supplementary trade practices such as the protection of dealer territories and the dissemination of individual company statistics.

Loescher sees this systematic use of the delivered-price formula as something which developed step by step, finally achieving a self-defining, self-enforcing operation which required no conferences or consultations to fulfill the limited objective of price stabilization. The objections which he sees to such a price structure are its inflexibility which tends to encourage excess capacity, excessive cross-hauling, inordinate selling costs, and the various distortions in emphasis which are created by limitation to nonprice competition. Loescher considers that substitute structural materials have provided an

upper limit to cement prices. Prices have not necessarily been too high in boom times but they have not fallen as they should have in weaker periods.

Loescher strongly condemns the basing-point system formula as it has operated in the cement industry. He suggests that the Federal Trade Commission's order (1948) was decidedly inadequate, becoming effective only when there is an industry plan or agreement and not affecting acts independently taken. Loescher would go considerably further to create more uncertainty, suspicion, and even distrust among the oligopolists. This requires not only the destruction of any rigidly controlling and therefore predictable pricing system, but positive action to create competition. Buyers should be assured that they may truck away from the mill. Large contractors should be able to buy directly. Identical bids should constitute inherent collusion, an unfair method of competition, and an improper price discrimination. If these did not succeed in promoting unsystematic pricing and a fairly flexible price level, he would have the Commission "voice the positive injunction 'compete!'" (p. 299), but this comes at the end of the book and the ways, means, and standards are not specified in any detail.

Since cement prices are at the heart of his analysis, one should look at the record. After the beginning of the first world war, they skyrocketed until 1920 and then fell gradually, with only one slight upturn, to 1932. After 1934 they were extraordinarily stable until the second world war. All this can be fitted into Loescher's picture—the long period of falling prices encouraging the "defensive monopoly" through which price stability all through the depression was achieved, although the prices of most nonagricultural commodities were rising after the 1933 low.

However, since 1942 cement prices have risen every year to reach new high levels. Loescher himself comments that since he regards formula pricing of the basing-point variety as primarily a reserve tool to be used to support prices in periods of weakness, he cannot judge the effectiveness of the FTC's Cement Order because of the prolonged postwar cement boom. However, almost immediately after he completed his writing (January 1957), weakness appeared but prices rose nearly 5 per cent in 1956, another 4 per cent in 1957, 2 per cent in 1958, and nearly 1 per cent in 1959. It of course should be noted that the failure of prices to reflect the 1957 recession was a general characteristic of nonagricultural prices. Loescher suggests that the industry "appears to have been administering a moderate price policy (possibly much too moderate) throughout most of the postwar boom, preferring to ration short supplies rather than allow price, even approximately, to clear the market" (p. 289). This suggests numerous questions as to how this was done; but these are current questions, and judgment on the FTC order in Loescher's terms will have to be delayed.

One wishes that the record had required Loescher to give more consideration to the relationship of formula pricing to upward price movements. Perhaps in the end one might come out with the propositions that the dominating factor in the situation is the oligopoly rather than the formula, that oligopolies will tend to act in certain ways, that certainty may make the end result of any

action more predictable but there still are choices open, and the final result may not be very different whether the choice is made in a more certain atmosphere or under a considerable degree of gamesmanship.

WILLARD L. THORP

Amherst College

Tin Cans and Tin Plate: A Study of Competition in Two Related Markets. By JAMES W. MCKIE. Harvard University Series on Competition in American Industry, 5. Cambridge: Harvard University Press, 1959. Pp. xiii, 321. $7.50.

The tin can industry, in which two firms of nearly equal size sell 80 per cent of the product, buys tin plate from the oligopolistic steel industry and sells its output principally to a monopolistically competitive canning industry in which there are some firms of considerable size and influence. Thus the theme of the study is bilateral market power in a vertical chain of markets. The author's ultimate purpose, which is more explicitly stated and followed than in most industry studies, is to determine whether the structure of the can industry uniquely determines a level of economic performance that is adequate by general standards of public policy—essentially the purely competitive norm plus progressiveness. If so, the industry is to be adjudged workably competitive. The main sources of data are the records of the antitrust cases of the 1940's and interviews with company officials, who were no doubt the more willing to talk because of loss of the suits. No new research methods are developed, and it is difficult to single out any specific advance in theory, but the author has done a very careful and competent job of interpreting for economists this segment of the industrial framework.

By general economic reasoning rather than statistical investigation the author establishes with reasonable plausibility that: demand is inelastic with respect to both price and income; short-run marginal costs are relatively constant nearly to peak capacity; and there exists no sharply defined optimum size of plant in the can industry. It was not these general characteristics, which are found in many industries, but two special conditions that shaped the policies of can manufacturers. The demand for cans in the packing of fruits and vegetables, over half of the total, is strongly seasonal and is, furthermore, highly unpredictable with respect to both quantity and precise timing. High costs of storage and of transportation rule out production in the off-season and offsetting on a nationwide basis, so the solution chosen is a regional network of plants that can be pushed to satisfy peak demands. A second peculiarity is that the final operation of can-making, sealing on the top, is performed in the canning establishments, on closing machines developed by the can manufacturers.

To avoid uncertainty canners preferred to contract for a season's unspecified requirements at a price fixed for the season, and were willing in exchange to accept long-term contracts. They also wished to lease closing machinery and receive the maximum amount of service. The can manufacturers took

advantage of this situation and, by excessively long can contracts and machinery leases at well below cost, were adjudged to have created a tying arrangement that artificially blocked the entry and growth of competitors. The decree of 1950 imposed, with a time limit in some cases, rather drastic remedies that were unfavorably regarded by small canners and, in the spirit of the Robinson-Patman Act, denied some genuine economies to large canners. There is some evidence that the can market has loosened up, but entry has not occurred and profits have not fallen. It is possible that the long-run effect may be simply to eliminate the competitive waste of duopoly and raise profits.

The author's main conclusion is that, with the added safeguards of the decree, the tin can industry, an 80 per cent duopoly, is workably competitive. This may cause some to remark that economists have come a long way since Marshall and, indeed, have little farther to go. The author has, I believe, satisfactorily established his conclusion, but certain special circumstances need to be emphasized. Collusively high prices are forestalled by: (1) American Can Company's early experience that high prices encourage entry; (2) the threat of large canners to integrate backward; (3) the virtual certainty that the gains would have to be shared with the steel industry in the bargaining over the price of tin plate. Buyers are informed, so there is little advertising. The requirements of the product are well defined and product competition has taken the form of technologically better ways of meeting those requirements. Yet the technology is such that the intensive research of the large companies into product and process has gained them only temporary advantages. There is some cross-hauling and service rivalry may be excessive, but the record with respect to nonprice competition is excellent. The special conditions of the industry have thus checked collusive actions and channeled rivalry into economically acceptable activities.

My main criticism is that the author focuses too myopically on his particular segment of industry and appears to lack perspective. An early chapter summarizing the relevant theory is largely ignored thereafter, and few comparisons are made with other industries. There are now a sufficient number of excellent industry studies so that cross-comparisons can be an effective start toward fruitful theoretical generalizations.

DANIEL C. VANDERMEULEN

Claremont Graduate School

The Economics of Competition in the Transportation Industries. By JOHN R. MEYER, MERTON J. PECK, JOHN STENASON, and CHARLES ZWICK. Cambridge: Harvard University Press, 1959. Pp. xvi, 359. $7.50.

This book makes an important contribution to a timely subject: the economic plight of the railroad industry and the advisability of relaxing its economic regulation. With this aim the study undertakes: (1) to measure the cost of alternative means of transportation, (2) to determine the structure of their respective markets, (3) to assess the effects of current regulation,

and (4) to propose policy measures designed to advance efficiency in the transportation industries.

To many students the most interesting part will be Chapters 2 to 5 where the authors place definite values on the fixed cost (sometimes called "threshold cost") and the marginal cost (sometimes approximated by average variable cost) in terms of cents/ton-mile or cents/passenger-seat-mile of transportation. For instance, the latter turns out to be: 1.3 c. by railroad day coach, 2.7–3 c. by parlor car, 5–6 c. by Pullman, 1.25 c. by intercity bus, 2.7–3.5 c. by piston-engined airplane, tourist class for distances over 500 miles, and 1.8–3.2 c. by first-class jet for distances over 1000 miles. It also emerges that trucks, and in particular diesel trucks, pay somewhat less than their share of road taxes; and passenger cars, in particular on urban roads, make up the difference. These chapters deal with the economic difficulties encountered in pinning down these cost figures. Detailed questions and statistical procedures are treated in appendices.

On the basis of their cost findings the authors derive some broad principles of an efficient division of labor in the transport industries (Ch. 6) with results reminiscent of a von Thünen model: high terminal cost discourages short-haul traffic by railroad and plane; higher variable cost, long hauls by truck (other than piggy back) and passenger train. From this description the objectives of a rational transportation policy begin to emerge: to discourage short-haul or low-density traffic by train and convert long distance trucking to piggy back operation on freight cars. The authors see no future in railroad passenger transportation. As Commissioner Howard Hosmer has put it: ". . . in a decade or so this time-honored vehicle [the railroad passenger coach] may take its place in the transportation museum along with the stage coach, the sidewheeler and the steam locomotive."

The question of what is standing in the way of achieving this optimal division of transportation activities is not treated in a separate chapter but is answered *passim:* the regulation of rates and of entry by public agencies and by cartels in the form of rate-making bureaus. The doctrine of rate-making by "value of service" is examined as an instrument of discriminatory pricing designed to recoup fixed cost in a (constant or) decreasing marginal-cost industry.

This leads to the next question of whether free competition can be relied on to remove the great inefficiencies that have resulted from excessive regulation—and in particular from the discriminatory freight tariff—and whether it can be relied on to produce the ideal division of labor and meet all demand that would pay its cost. In Chapter 8 the authors find that trucking has indeed all the prerequisites of a competitive industry—small units and numerous firms—and that, in all but the overland haul of bulk commodities where monopoly appears to be a real possibility, the elasticities of substitution among firms and forms of transportation are such as to render competition effective. The policy conclusions stated *passim* and in the last chapter are in essence that there should be a considerable relaxation of regulation, particularly of entry into and exit from transportation industries, but no outright removal

of rate regulation, especially not of maximum and even minimum rates on bulk transportation.

This is an interesting and useful work. While it contains no great surprises, it serves to convert more or less vague guesses into more precise estimates of cost relationships. It also constitutes an important step toward a theory of transportation organized along the lines of the general theory of price. This remains true even though the authors, addressing themselves to a public of nonprofessionals, have chosen to advance their arguments in a style which is often repetitive and laboriously elementary to the detriment of theoretical clarity and precision.

While it is all too easy to criticize the techniques that apparently seemed necessary to get results in a fairly short time, many readers will feel uncertain about the true meaning of the statistical cost estimates in view of the obvious question not discussed by the authors: How serious is the bias introduced into the least-squares estimates by leaving other relationships out of the model, in particular those that have determined the size of track and the various other capital items—the "size variables" in the authors' measurements? For obviously these size variables are not independent variables. A different point may be made about highway cost: the authors do not consider congestion and resulting times losses, and this deprives their discussion of rail commutation versus passenger car transport of much of its relevance.

Apart from these technical questions I have only one point of general criticism: In their policy recommendations the authors appear to be overly cautious. If one agrees with their statement that "reform is most urgently needed . . . in the thinking of management and union groups. . . . Many of the preceding suggestions could be carried out by properly vigorous, imaginative, and knowledgeable managements within the framework of present regulatory practices" (pp. 271-72), one is led to add that precisely this type of management or management behavior would be attracted into railroading only when all or all but traces of the present system of regulation with its stifling effects on initiative had been removed. The case for free competition seems to emerge much more strongly from the analysis of this book than the authors are willing to admit. In any case transportation could be made subject to the antitrust laws to prevent an unlikely repetition of the early railroad wars. A great industry as deseperately sick as the railroads can be cured only by drastic means. The partial measures suggested by the authors might actually tend to reduce railroad earnings on high-value commodity shipments while preventing them from raising revenue on long-distance bulk hauls. No matter where one stands on these policy questions one can, I think, agree with the concluding statement:

> Transport regulation began in a day and age when the North American continent was first beginning to see the development of a modern industrial economy characterized by large oligopolistic corporations . . . whose operations were restrained by only a minimum of competitive checks. . . . Since those early beginnings industrial concentration has grown markedly, farmers and other small producers have become powerfully organized,

government has developed new techniques and agencies to deal with the problems created by increased concentration of economic power. At the same time, technological advance has created new and very effective competitors to rail transportation. While all this has been going on, regulatory policies in transportation have changed but little. The resulting economic absurdities cry out that some action should at long last be taken.

MARTIN BECKMANN

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Industrial Organization. By JOE S. BAIN. New York: John Wiley & Sons, 1959. Pp. xviii, 643. $9.25; text ed., $7.75.

This is the most comprehensive book yet to appear in "the area of economics usually designated as Industrial Organization," which has been carried forward by many scholars since it was pioneered in the 1930's by E. S. Mason but by none more productively than Joe S. Bain.

Its heart is an eight-chapter empirical and analytical study of the American economy, mainly although not exclusively, the manufacturing sector. Attention is focused on the individual industry, but Bain does not present a series of industry studies. "Although the industry-study approach has a demonstrated entertainment value, it is seriously deficient in that it encourages a casuistic process of 'generalizing from a single instance'; correspondingly is prone to engender confusion between accidental associations and fundamental tendencies toward association; nearly always deals with too many parameters and variables for effective analytical handling; and provides no straight or passable road toward scientific generalizations" (Preface, pp. viii-ix).

Using a cross-sectional approach, therefore, he successively examines market (1) structure, (2) conduct—a category which Bain develops intensively, and (3) performance, and seeks interrelationships among them. Performance is what we ultimately want, but for well-known reasons direct government regulation of performance should be minimal. However, public policy might operate through structure and conduct if they in fact determine performance. This policy problem—as well as scientific curiosity—underlies the central inquiry of the industrial organization field: Is performance determined by structure (or by structure and conduct, if conduct can be independently observed, which Bain generally doubts)?

No review can adequately indicate the amount of evidence Bain assembles (drawing heavily, but not exclusively, on a sample of some 20 manufacturing industries), the care and objectivity with which he weighs it (e.g., in the subtle analysis of "excess capacity," pp. 358-62, and of profits, pp. 363-87), and the caution with which he draws conclusions. In brief summary, however, he finds the structural conditions for workable competition to be the following: (1) "high" or "very high" seller concentration "generally seems to be conducive to poor performance in the crucial matter of price-cost relations or profits, without evidently bestowing offsetting advantages in other dimensions of market performance" (p. 423). He discovers a distinct "break" at

the point where the largest eight sellers supply more than two-thirds to three-fourths of the output of an industry; moderately concentrated oligopolies appear to perform about as well as relatively atomistic industries. (2) High barriers to entry are also adverse, compared with moderate and low. (When accompanied by high barriers to entry, high concentration is even worse than when it occurs alone.) (3) Extreme product differentiation increases concentration and raises entry barriers much more than do economies of scale. Also, it results in wastefully high selling costs. Therefore it does *not* make competition more "workable" than it otherwise would be. Moreover, it seems to be hard to correct by public policy, because it is usually associated with products consumers cannot readily evaluate because they are infrequently purchased, complex in design and function, etc. (But soap, cigarettes, and possibly whiskey are puzzling.)

Bain's policy recommendations, tough-minded but judicious, follow naturally from his empirical and analytical investigation. They range over a wide field, but space confines us to one of them. He distrusts direct government regulation of performance, and except for some predatory and exclusionary practices, it is not possible to find an operational set of conduct prerequisites for workable competition. Consequently, he proposes to amend the Sherman Act "to state that structural situations (involving high concentration and impeded entry) which might be expected to have and demonstrably do have monopolistic performance tendencies are generally illegal, without particular reference to the lines of market conduct through which the undesirable structure has been created, maintained, and exploited" (p. 608). He would change the usual remedy to dissolution or dismemberment if there would be no serious side effects and lesser remedies would not clearly suffice. Where undesirable structures originate in product differentiation associated, as noted above, with relatively immutable consumer characteristics, this will not be easy.

How would the book serve as a textbook? In his preface, Bain comments, "I realize that the book is not written to fit numerous existing course outlines in the general field, but would of course be pleased if some such outlines were rewritten to fit the book." This is good advice, especially because it would assure that discussion of public policy would occur only after a thorough economic analysis. Although the reasons for avoiding a "collection of industry studies" approach are impressive, some acquaintance with these would seem necessary to convey the historical, personal and accidental factors that affect every market and to offset the necessarily static bias of cross-sectional treatment. Unfortunately, the length of this book would prevent the use of much supplementary material. In general, for undergraduates the length and the often tedious style (especially in early chapters) are severe handicaps. For graduate students, footnote citations to other works should have been provided, or a larger number of "supplementary readings." As a general treatise, however, this is undoubtedly the most thorough in its field. It has real substance. Its spirit is thoroughly scientific.

HOWARD H. HINES

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Land Economics; Agricultural Economics; Economic Geography; Housing

The Great Farm Problem. By WILLIAM H. PETERSON. Chicago: Henry Regnery Co., 1959. Pp. xix, 235. $5.00.

This readable little book presents an illuminating discussion of the "politiconomics" of American agriculture in historical perspective. The costly impasse into which the "farm program" has led is damaging the national economy and our international relations. The book is therefore timely. Though written in journalistic style for ordinary citizens, it should not be lightly ignored by economists. Its content is predominantly true and significant, and most of its shortcomings are readily discernible. Some of the language is too strong, but its blunt speaking is mostly warranted. If its brief proposals seem at once too bold and too weak, it is pertinent to observe that many minds through many years have failed to produce a solution of "the farm problem" that is at once economically workable and politically acceptable.

The prologue ("The Vanishing Farmer of Grant Wood") rightly stresses the transformation of American farming in recent decades, under "the inexorable march of technology and economics in a still capitalistic society" (later elaborated on pp. 147-53). The author's broad "Argument" is briefly presented in Chapter 1; his "Analysis" in a long Chapter 7; his "Summary and Conclusions" in a 4-page Chapter 8. Finally, there is a brief "Epilogue" ("Nature's Laws and Man's Laws").

Chapters 2-4 present the highlights of agropolitics and agrarian movements from 1600 to 1917. These provide a historical background for later farm legislation but deliberately give little attention to the evolution of American agriculture in this long period. The selected details bring out the "agrarian proclivity for inflation" (pp. 36-37), public land disposals at bargain prices or free (pp. 39, 50), cheap transport usually involving losses "to the public treasuries" (p. 49), cheap credit (p. 88), and allegedly "the farmer's penchant for intervention from colonial days to the present" (p. 13). One may question this and some other generalizations, e.g., that the Civil War was "created by intervention—the North with tariff intervention, the South with slave intervention" (p. 52).

Chapters 6-7 sketch the evolution of activist farm programs from the first world war to 1959, under powerful and persistent political pressures. Here is a broadly reliable summary of a sorry history, which deserves a wide reading. Insufficient emphasis, however, is laid on the important fact that the central objectives have been to protect and raise farmers' income and status, by political measures, above what a free economy would yield them. Some partial or temporary successes are largely overlooked, and even of the more controversial elements of the farm program it is an exaggeration to say: "A generation of 'farm policy' adds up to hopeless tinkering, fantastic losses, and planned chaos . . ." (p. 217). Few will endorse the author's implication that the creation and development of the U. S. Department of Agriculture, state agricultural colleges and experiment stations, the agricultural extension and farm credit systems, the Rural Electrification Administration (p. 145), and

various forms of federal regulation (Ch. 4) were all unwise policy moves—whatever the criticisms to which they are properly subject.

Peterson's viewpoint is that of an uncompromising "liberal" of the Von Mises school, for whom "statism" is the cardinal economic sin. He finds "the great farm problem" simply political intervention (pp. 8-13). He is basically hostile to any and all kinds of government intervention, and he evinces remarkable faith in the adequacy of a wholly free market. Few economists share this undiscriminating hostility and faith, yet the disgraceful record of failure in much agricultural intervention understandably tempts some to say: "Away with it all!"

The failures, broadly construed, include the Federal Farm Board experiments, the Agricultural Adjustment Administration's more comprehensive ones, various attempts to restrict farm production through acreage allotments, marketing quotas, and "Soil Banks," and the Commodity Credit Corporation's surplus-concentration and disposal programs. Technological advances and government stimuli keep generating surpluses faster than they can be disposed of by all sorts of means. Yet political resistance to effective program revisions continues so powerful that the CCC "investment" in surplus farm products threatens to rise from $9 billion in mid-1960 to $12 billion in 1963. It is outrageous that our hard-pressed federal budget should be burdened with several billion dollars a year—equal to some 40 per cent of farm income from farming—to swell cash incomes and enhance farm land values to benefit mainly the larger farmers while restricting their freedom of action.

In his preface the author promised to spell out a simple "remedy for our farm ills" (p. xii). There is none, of course. His one-page "positive program . . . to be gradually effectuated" (p. 213) by no means fulfills his promise. Its three main points are: (1) the progressive abandonment of all price supports and guarantees, all acreage and marketing controls; (2) the gradual sale of government holdings of farm products back to the farmers; and (3) "the progressive abandonment of statism . . . in every phase of American industry." This bold "remedy" is obviously weak politically; but it is hard to conceive that, if adopted with or without tempering supplements, it could cure all the "farm ills" that have given rise to the measures condemned.

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Related Disciplines

Higher Education for Business. By ROBERT AARON GORDON and JAMES EDWIN HOWELL. New York: Columbia University Press, 1959. Pp. xi, 491. $3.50.

The Education of American Businessmen. By FRANK C. PIERSON and others. New York: McGraw-Hill Book Co., 1959. Pp. xvii, 740. $7.50.

That two leading foundations (Ford and Carnegie) should simultaneously commission major studies on collegiate education for business may have been

purely coincidental. Yet the coincidence suggests that influential educational leaders have suspected the need for reform of business education. Both studies have confirmed this suspicion.

The staffs of the two foundations were doubtless aware that an appraisal of business education and the prescriptions that would flow from this appraisal would depend in part upon the kind of person selected to direct such a study. Both foundations chose distinguished economists of broad interests who have *not* been closely identified with business schools. (The Carnegie study was directed by Professor Pierson of Swarthmore and the Ford study by Professor Gordon of California.) It is hardly surprising therefore that the approach and the conclusions in the two volumes are similar. The total impact might have been stronger if the similarity of conclusions had resulted from two studies made by persons from very different perspectives. It is intriguing to consider how the conclusions might have varied had the studies been directed by accountants, psychologists, industrial engineers, marketing specialists, or educationists—all of whom have some claim to competence in the field of business education.

In both studies, the question of whether there is a legitimate place in the university for the undergraduate business school was considered. The answer was scarcely a ringing testimonial in its behalf. Yet in a sense the most significant conclusion of both volumes is that the undergraduate business school does (or could) have a useful function, and that it should survive. This finding, however, by no means implies approval of things as they are.

The criticisms of current business education are sweeping and devastating, and they apply to both graduate and undergraduate business education. The Gordon-Howell report refers (pp. 5-9) to "low level and narrow vocational character," standards that are "embarrassingly low," "not providing the kind of education tomorrow's businessmen will need," undefined objectives, "the rut" in which business schools have "plodded." The Pierson report speaks (pp. ix-xvi) of vague definition of subject matter, low academic standards, slack admission requirements, inflation of subject matter, excessive specialization, and "sorely deficient" general quality. Both reports concede that there are notable examples of schools to which these criticisms do not apply, but that the exceptions are rare. Both point out, however, that there are stirrings in business education and that with leadership improvement is feasible.

Business education is a subject of great moment because of the enormous and growing enrollments involved. Business accounts for a major fraction of all higher education. The Pierson report ably describes the development of the field (Ch. 3) and the Gordon-Howell report presents an excellent statistical analysis of its growth (Ch. 2).

A basic problem is that business education, according to overwhelming evidence, attracts students of relatively low average quality. Both reports recommend an upgrading of student quality. This might be done in several ways: by abandoning some kinds of work that might be transferred to junior colleges and noncollegiate institutions; by raising the intellectual rigor of business school courses and thus discouraging weak students; and by imposing selective admissions requirements. It is pointed out, however, that

there is as yet no proven method of selecting students who have the capacity for future success in business careers.

The issues concerning the low quality of students in business schools are among the most difficult. At present these schools are apparently a major haven for many students who are admitted to the university but do not have the ability to compete in most other areas. If the authors' recommendations for greater rigor were followed, many of these students would have no place left for them in the university (except possibly the school of education) and so would be denied the benefit of college education and the honor of college degrees. These reports, therefore, are basically dealing with the question of what persons have a right to be in the university or what minimal level of intellectual rigor should be demanded there. They suggest that the business school should be at least as demanding as the liberal arts college, and preferably more so. I personally take issue with the occasional suggestion in the Gordon-Howell report that those students unqualified for a rigorous business program might better be shifted to the arts college (e.g., pp. 330, 338). The authors also state, however (p. 141): "It is partly because of the less gifted student that we have argued for reform rather than the abolition of the undergraduate program."

The objectives of the business school are inescapably unclear because business itself is changing, because much of the skill and knowledge needed for business success cannot be taught in college but must be learned through experience, because the demands on a businessman vary as he proceeds through his career, because the activities we subsume under "business" are many and varied, and because the businessman is concerned both with his organization and with the environment in which the organization functions. The authors of both reports, therefore, are inclined to discount preparation for the first job, to emphasize skills that are applicable to many situations, general educaton, solid analytical content, social responsibility, sound work habits, and basic tools such as writing, speaking, mathematics. They believe that there are many possible kinds of education relevant for future businessmen and that the business school provides only one (or a few) of these. Along this line, the Gordon-Howell report strongly recommends (p. 125) a sequence of a limited number of business courses for students majoring in arts, engineering, or other fields and who may seek business careers. The words "analysis" and "analytical ability" appear prominently in both reports. Both recommend fewer courses in business, particularly fewer descriptive courses. It would not be far from accurate to describe the authors' attitude toward many present business courses, with respect to both content and method, as contemptuous.

A major problem of the undergraduate business school is that it is trying to provide both general education and professional education in the span of four years with the result that neither is accomplished satisfactorily. The reports recommend that the weight be shifted toward general education. The Pierson report suggests 50 to 55 per cent of the student's work be in areas outside business and economics (p. 195). The Gordon-Howell report suggests that this percentage should be "not less than half" (p. 133). Both reports

emphasize that all is not well in the arts college and that changes are needed there too if the nonbusiness portion of the student's education is to serve its purpose. The Pierson report has a very illuminating section (Ch. 8) on the kinds of nonbusiness courses that would meet the need. Pierson writes (p. xii): ". . . any steps that are taken to shift the work of business students from the business specialties to greater emphasis on general background subjects need to be coupled with a revitalization of the liberal arts studies as well. Merely to require these students to take a variety of courses in nonbusiness areas taught in a perfunctory manner by instructors whose main interests lie elsewhere will not meet the situation and in fact may cause much harm." This observation led me to the thought that if Pierson, Gordon and Howell had prepared reports on liberal arts schools, they might have offered criticisms nearly as damaging as those they have leveled against business schools.

Both reports include sections on business research (which they consider to be in a parlous state) and on the preparation of faculty for teaching the kind of program they envision. Research and teacher preparation are considered to be key elements in achieving needed reforms. Both reports contain excellent chapters on adult education of businessmen including the sizeable programs sponsored by business firms. Both discuss education in small colleges having no separate business schools. The Pierson report has several excellent chapters on the various special fields of business contributed by specialists in these areas, and also a splendid contribution by G. L. Bach on "Managerial Decision Making as an Organizing Concept."

I can offer nothing but praise for these two reports. They are judicious, restrained, and statesmanlike. They offer realistic and practicable suggestions. They recognize that there are varying local situations and that not all institutions can or should try to do the same things. They point out that the field is in flux and that there are abundant opportunities for experimentation. Yet they never flinch from the basic proposition that radical reform is clearly indicated.

These reports have significance far beyond business education. They are relevant to all higher education, not only in the professions but also in the liberal arts. They show that there are many routes to good education, and that merely because a given program is designed in part for practical career objectives, it need not be narrow, stultifying, or illiberal. Indeed, they might have emphasized that it is no sin (as sometimes suggested by purists) to capitalize on the motivation provided by a career interest to stimulate students. The tragedy of business education is that the built-in career motivation has not been exploited in the interests of excellence.

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Population; Welfare Programs; Standards of Living

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Related Disciplines

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NOTES

A nominating committee consisting of George W. Stocking, chairman, Vincent W. Bladen, Everett E. Hagen, Charles J. Hitch, Frank C. Pierson and Edwin Young has submitted the following slate of nominees for 1961 officers of the American Economic Association:

President:
Paul A. Samuelson

First Vice President:
Edward S. Mason

Vice President:
Solomon Fabricant
Milton Friedman
Walter W. Heller
Richard A. Lester

Executive Committee
Kenneth J. Arrow
Abram Bergson
Ewan Clague
Charles P. Kindleberger

Representative, Social Science Research Council
George H. Hildebrand

The Norman S. Buchanan Prize

Friends of Norman S. Buchanan have established a fund at the University of California, Berkeley, to provide a biennial award of $250 for an outstanding doctoral dissertation.

New Publication

The Food Research Institute, Stanford University, has begun publication of a journal that contains articles reflecting the current research interests of its staff members. The first issue of *Food Research Institute Studies* was published in February 1960. There will be three issues a year, in February, May and September, with an annual subscription price of $7.00. All communications should be addressed to Food Research Institute, Stanford University, Stanford, California.

Announcements

Section K—Social and Economic Sciences—of the American Association for the Advancement of Science will hold sessions for contributed papers at the annual meeting of the A.A.A.S. in New York, December 26-31, 1960. Association members interested in presenting a paper based on recent research at these sessions should forward titles and abstracts not later than September 1 to Donald P. Ray, Secretary of A.A.A.S. Section K, National Institute of Social and Behavioral Science, George Washington University, Washington 6, D.C.

The Maxwell Graduate School of Syracuse University, in cooperation with the Danforth Foundation, will present the second faculty seminar dealing with problems of metropolitan areas during the period August 28-September 7, 1960. This ten-day seminar will focus on identification of substantive problems of urban regions and on the research methods available for the analysis of those problems. The 1959 seminar was considered very

successful as an interdisciplinary approach to the complexity of the metropolis, and this year's plan is built upon that experience. Jesse V. Burkhead of the Maxwell School, Norton E. Long of Northwestern's Transportation Center, and Otis D. Duncan of the Population Center, University of Chicago, among others, will serve as discussion leaders.

The Inter-University Committee again has limited funds available for grants to colleges and universities in support of postdoctoral faculty specialists on the Soviet Union or East Central Europe, for short-term, study-related visits in those areas. Countries within the scope of the program are: the Soviet Union, the Communist-controlled countries immediately continguous upon it, and Albania, Bulgaria and Yugoslavia. Altthough awards have already been made to candidates selected from applications received up to April 20, additional awards can be made throughout the year if funds remain available. Applications should be sent to the Inter-University Committee on Travel Grants, 409 West 117 St., New York 27, N.Y.

The *1960 Directory of College Graduates Available for Business Personnel*, issued annually by Alpha Kappa Psi, national business fraternity, will be mailed to business firms interested in employing college graduates with majors in business fields, economics and statistics. The selected list presents photographs and brief factual summaries of qualified graduates of leading universities and colleges who will be available for employment in 1960. Copies of the directory may be obtained from Alpha Kappa Psi Fraternity, 111 East 38th Street, Indianapolis 5, Indiana.

Deaths

Oskar N. Anderson, University of Munich, February 12, 1960.

Julius B. Bearnson, emeritus University of Utah, October 17, 1959.

John D. Black, emeritus Harvard University, April 12, 1960.

Margaret L. Brew, Cornell University, November 21, 1959.

Alzada Comstock, emeritus Mount Holyoke College, January 15, 1960.

Howard R. DeLancy, October 1959.

Howard W. Green, July 8, 1959.

Rupert A. Hawk, Grinnell College, October 27, 1959.

Julian L. Holley, Johns Hopkins University, February 1959.

George R. Keith, January 10, 1960.

Svend Laursen, February 1960.

James E. LeRossignol, emeritus University of Nebraska, December 2, 1959.

Erik Lindahl, University of Uppsala, January 1960.

Archibald M. McIsaac, Syracuse University, January 12, 1960.

Carl V. Noll, Hunter College, February 26, 1960.

Vladimir G. Simkhovitch, emeritus Columbia University, December 9, 1959.

Retirements

John W. Dietz, University of Florida, June 1960.

Otto H. Ehrlich, New York University.

Russell H. Moore, Ohio State University, March 1, 1960.

Bervard Nichols, University of Pittsburgh, June 1960.

Edward L. Smith, Hunter College, February 1, 1960.

H. L. Wilson, University of Miami, Florida.

Visiting Foreign Scholars

Douglas C. Hague, Sheffield University: visiting professor Duke University, 1960-61.

Margaret Hall, Somerville College, Oxford University: visiting professor of economics, Massachusetts Institute of Technology, spring 1961.

Terence W. Hutchison, University of Birmingham, England: visiting professor of economics, University of Michigan, summer session, 1960.

Alexander M. Kerr, University of Western Australia: visiting lecturer, The University of Texas, second semester, 1959-60.

Robin Marris, Kings College, Cambridge University: visiting professor of economics, Northwestern University, fall quarter, 1960-61.

L. O'Nuallain, University College, Galway, Ireland: visiting scholar, University of Michigan.

Don Patinkin, Hebrew University, Jerusalem: visiting professor of economics, Northwestern University, fall 1960.

Michael Postan, Cambridge University: visiting professor of economics, Massachusetts Institute of Technology, fall 1960.

Emil Rado, University College, Legon, Ghana: visiting assistant professor, Williams College, 1960-61.

Mary Robertson, University of Nottingham: Duke University, summer 1960.

Hugh Rose, Exeter University, Exeter, England: visiting associate professor, Northwestern University, 1960-61.

Omar Wahby, University of Cairo, Egypt: research associate, department of economics, Iowa State University (Ames).

Promotions

Francis Bator: associate professor of economics, Massachusetts Institute of Technology.

Edwin W. Bishop: assistant professor of economics, Georgetown University.

August C. Bolino: associate professor, Saint Louis University.

George H. Borts: professor of economics, Brown University.

J. W. Brandon: professor of accounting, School of Business Administration, University of Miami.

Michael J. Brennan: associate professor of economics, Brown University.

Albert Buckberg: assistant professor of economics, Iowa State University (Ames).

Deane C. Carson: associate professor of economics, Brown University.

Paul G. Clark: professor of economics, Williams College.

A. E. Crotty: assistant professor of accounting, School of Business Administration, University of Miami.

John C. Dawson: associate professor of economics, Grinnell College.

Lev E. Dobriansky: professor of economics, Georgetown University.

Randall A. Hoffmann: assistant professor, department of economics, Iowa State University (Ames).

Holland Hunter: professor of economics, Haverford College.

Boris Ischboldin al Bakri: professor of economics, Saint Louis University.

Jacob J. Kaufman: professor of economics, Pennsylvania State University.

Kenyon A. Knopf: professor of economics, Grinnell College.

Dorothy Lampen: professor of economics, Hunter College.

John F. Lubin: associate professor of industry, Wharton School, University of Pennsylvania.

Edwin Mansfield: associate professor of economics, Carnegie Institute of Technology.

Will E. Mason: professor of economics, Pennsylvania State University.

Joseph P. McKenna: professor of economics, Saint Louis University.

Arthur C. Meyers, Jr.: professor of economics, Saint Louis University.

G. L. Moss: associate professor of accounting, School of Business Administration, University of Miami.

Carl A. Nordstrom: assistant professor of economics, Brooklyn College.

Nilan Norris: associate professor of economics, Hunter College.

Richard W. Poole: assistant professor of economics, Oklahoma State University.

K. L. Roberts: assistant professor of accounting, School of Business Administration, University of Miami.

Gunther H. Ruff: associate professor of economics, Georgetown University.

Tadeusz Siedlik: associate professor of business and economics, University of Maine.

Jerome L. Stein: associate professor of economics, Brown University.

Lawrence L. Werboff: associate professor of economics, Pennsylvania State University.

Melvin I. White: professor of economics, Brooklyn College.

J. W. Wilcox: associate professor of economics, School of Business Administration, University of Miami.

Ronald P. Willett: assistant professor of marketing, School of Business, Indiana University.

Viola Wyckoff: associate professor of economics, New York University.

Shih-Cheng Yu: associate professor of business and economics, University of Maine.

W. H. Zukowska: assistant professor of accounting, School of Business Administration, University of Miami.

Administrative Appointments

John R. Coleman: head of department of economics and promoted to professor of economics, Carnegie Institute of Technology.

Richard M. Cyert: head of department of industrial management, and promoted to professor of economics and industrial administration, Carnegie Institute of Technology.

Melvin A. Eggers: chairman, department of economics, Syracuse University.

David Felix: director, Wayne State University Center for Economic Studies.

William E. Gordon: chairman, department of economics and business administration, Park College, Parkville, Missouri.

Everett D. Hawkins: has resumed chairmanship, department of economics, Mount Holyoke College, after spending a year and a half in Indonesia.

Samuel P. Hayes, University of Michigan: chief, social science department, UNESCO Secretariat.

John L. Johnson: assistant dean, general education division, Ferris Institute, Big Rapids, Michigan.

Ernest Kohn: acting chief, division of research and statistics, New York State Banking Department.

Harold C. Krogh, University of Kansas: director of research, Society of Chartered Property and Casualty Underwriters.

Glenn Miller: assistant director, Center for Research in Business, School of Business, University of Kansas.

John P. Miller: director, social science division, Yale University.

Hollis W. Peter: director, Foundation for Research on Human Behavior.

B. U. Ratchford, Duke University: Vice-President, Federal Reserve Bank of Richmond.

Michael Schiff: area chairman, accounting, statistics and taxation departments, Graduate School of Business Administration, New York University.

James H. Stauss: dean, Grinnell College.

M. G. Taylor, University of Toronto: principal and vice president, University of Alberta.

Cyril A. Zebot: acting chairman, department of economics, Georgetown University.

Appointments

William H. L. Anderson: assistant professor of economics, University of Michigan.

Jules Backman: research professor of economics, New York University.

Robert R. Barnes: instructor in finance, Wharton School, University of Pennsylvania.

Thomas B. Birkenhead: instructor in economics, Brooklyn College.

Jacob G. Birnberg: instructor in accounting, Graduate School of Business, University of Chicago, effective October 1960.

Robert J. Connor: assistant professor of production management, Graduate School of Business, University of Chicago, effective October 1960.

Carl T. Devine: visiting professor of accounting, Graduate School of Business, University of Chicago, effective October 1960.

T. A. Finegan: assistant professor of economics, Princeton University.

Franklin Fisher: assistant professor of economics, Massachusetts Institute of Technology.

Robert W. Fogel: assistant professor of economics, University of Rochester.

Samuel Frumer: faculty lecturer in accounting, School of Business, Indiana University.

H. G. Georgiadis: assistant professor of economics, Princeton University.

Robert W. Gillespie: assistant professor, University of Illinois.

Jack K. Greenberg: instructor in industry, School of Business Administration, University of Pittsburgh.

Daniel C. Hamilton: associate professor of business economics, Graduate School of Business, University of Chicago.

John C. Harsanyi, Australian National University, Canberra: professor of economics, Wayne State University.

James B. Herendeen: research associate, department of economics, Iowa State University (Ames).

George H. Hildebrand, University of California at Los Angeles: professor of economics and industrial and labor relations, Cornell University.

William R. Hughes, Harvard University: assistant professor of economics, Wesleyan University, effective 1960-61.

Erich Isaac: assistant professor of economics, The City College, New York, effective fall 1960.

J. Hugh Jackson, dean emeritus, Graduate School of Business, Stanford University: visiting professor, University of Minnesota, spring quarter 1960.

Charles L. Jamison: visiting professor, University of Minnesota, spring quarter 1960.

Richard I. Leighton: instructor in economics, Duke University.

Paul W. MacAvoy: assistant professor of business economics, Graduate School of Business, University of Chicago, effective October 1960.

Alvin Marty, Northwestern University: assistant professor of economics, The City College, New York, fall 1960.

D. McFarland: assistant professor of economics, Princeton University.

Ronald I. McKinnon, University of Minnesota: assistant professor of economics, Syracuse University.

Janet K. Messing: instructor in economics, Hunter College.

Robert Miki: assistant professor of economics, Williams College.

Glenn H. Miller, Jr.: instructor in economics, University of Kansas, September 1960.

Franco Modigliani, Carnegie Institute of Technology: professor of economics, Northwestern University, effective September 1960.

Marc Nerlove, University of Minnesota: professor of economics, Stanford University.

M. Olson, Jr.: assistant professor of economics, Princeton University.

D. Orr: assistant professor of economics, Amherst College.

David L. Paden: visiting assistant professor of transportation, School of Business, University of Southern California.

Edith T. Penrose, Johns Hopkins University: reader in economics in London School of Economics and School of Oriental and African Studies, University of London, effective October 1960.

R. C. Pratt: assistant professor of political economy, University of Toronto.

William G. Rhoads: assistant professor of economics and assistant director of Graduate Training Program in Development Economics, Williams College.

Roderick H. Riley, formerly executive director, Joint Economic Committee of Congress: economic advisor, U. S. Information Agency.

Charles E. Rockwood: instructor in economics, Florida State University.

Karl Roskamp, Brandeis University: assistant professor of economics, Wayne State University.

Norman Schneider, University of California, Berkeley: assistant professor of economics, Williams College.

T. Y. Shen, Federal Reserve Bank of Boston: assistant professor of economics, Wayne State University.

Howard J. Sherman: assistant professor of economics, Wayne State University.

Samuel B. Stewart, former Tax Commissioner, State of Oregon: member of Brookings Institution Korean Tax Advisory Group in Seoul.

Balder von Hohenbalken: research associate, department of economics, Iowa State University (Ames).

Larkin B. Warner, Indiana University: assistant professor of economics, Oklahoma State University.

James E. Young: assistant professor of economics, University of Arizona.

Leaves for Special Appointments and Assignments

Rockwood Q. P. Chin, Berea College: lecturer, University of California, Santa Barbara, spring term 1960.

Lorne D. Cook, Pomona College: Brookings research professor, 1960-61.

John M. Culbertson, University of Wisconsin: visiting associate professor of economics, University of Michigan, second semester 1959-60.

John H. Cumberland, University of Maryland: consultant on economic development, Organisation for European Economic Cooperation, European Productivity Agency, in Paris, 1959-60.

Richard A. Easterlin, Wharton School, University of Pennsylvania: visiting professor, Stanford University, 1960-61.

Wendell C. Gordon, University of Texas: lecturer in international economic theory, University of Buenos Aires, Argentina, first semester, 1959-60.

William D. Grampp, University of Illinois: visiting professor of economics, The City College, New York, 1960-61.

George E. Lent, Amos Tuck School, Dartmouth College: visiting professor of finance, School of Industrial Management, Massachusetts Institute of Technology, spring 1960.

John H. McMichael, Wharton School, University of Pennsylvania: with International Cooperation Administration, in Costa Rica, spring term 1959-60.

Roy E. Moor, Williams College: Brookings National Research professorship, 1960-61.

Walter C. Neale, University of Texas: Fulbright senior visiting lecturer in economic development, Panjab University, Chandigarh, India.

Alpheus W. Smith, New York State School of Industrial and Labor Relations, Cornell University: visiting lecturer, University of Hawaii, February-June 1960.

Leslie L. Waters, University of Indiana: Visiting Rose Morgan professor, University of Kansas. spring semester 1960.

Resignations

Alvin L. Marty: Northwestern University.

Ray H. McClary: School of Business, Indiana University.

Charles F. Meehling: department of economics, Brooklyn College.

Richard K. Stuart: University of Maine.

Miscellaneous

Eduard Heimann: has lectured in twelve German universities; received a "Festschrift" *Zur Ordnung von Wirtschaft und Gesellschaft* (Tübingen, 1959).

Jorge Mendez Munevar: elected member of the National Planning Council 1959-61, by the Colombian Congress.

VACANCIES AND APPLICATIONS

The Association is glad to render service to applicants who wish to make known their availability for positions in the field of economics and to administrative officers of colleges and universities and to others who are seeking to fill vacancies.

The officers of the Association take no responsibility for making a selection among the applicants or following up the results. The Secretary's Office will merely afford a central point for clearing inquiries; and the *Review* will publish in this section brief description of vacancies announced and of applications submitted (with necessary editorial changes). Since the Association has no other way of knowing whether or not this section is performing a real service, the Secretary would appreciate receiving notification of appointments made as a result of these announcements. It is optional with those submitting such announcements to publish name and address or to use a key number. Deadlines for the four issues of the *Review* are February 1, May 1, August 1, and November 1.

Communications should be addressed to: The Secretary, American Economic Association, Northwestern University, Evanston, Illinois.

Vacancies

Economist: The Office of Area Development, U.S. Department of Commerce, has positions for several economists in the fields of economic and regional development, industrial location, and statistics. Salaries $4,980 to $8,330, depending on qualifications and experience. Master's degree required. Write to Victor Roterus, Director, Office of Area Development, U.S. Department of Commerce, Washington 25, D.C. Please submit Civil Service Form 57 (available from local post offices).

Economist, Central Intelligence Agency: Openings in the United States government are available for qualified economists interested in economic research concerning foreign areas. Positions involve the measurement of aggregative economic performance as well as detailed research on major industries and on agriculture, transportation, communications, and international trade. Prefer applicants with an advanced degree or substantial amount of graduate work in economics. Salary scales and other benefits comparable to civil service. Starting salary depends on experience and training. A minimum of 5 years U.S. citizenship is required. For application form and interview arrangements, write to: Office of Personnel, Central Intelligence Agency, 2430 E Street, N.W., Washington 25, D.C. Please give personal data and résumé of education and experience.

Economist: Unusual opportunity for regional economist in new agency. Write to: State Planning Office, State Capitol, Santa Fe, New Mexico.

Chair of Economics: Salary £S.2760 per annum. Cost-of-living allowance approximately £S.180 per annum at present. Outfit allowance £S.50. Family allowances: Wife £S.60 p.a., 1st child £S.90 p.a., 2nd and 3rd child £S.30 p.a. each (£S.1 = £1.0.6 sterling). Passages for appointee and family on appointment, termination and annual leave. Superannuation Scheme. Appointment on contract for five years with possibility of renewal. Unfurnished accommodation provided at 7½% of salary. Applications (10 copies) detailing qualifications and experience and naming 3 referees should be sent to: Registrar, University of Khartoum, c/o Inter-University Council for Higher Education Overseas, 29 Woburn Square, London, W.C. 1, England (from whom further particulars may be obtained).

Senior economist: Needed for supervisory position in economics research division of major oil company. Qualifications: Ph.D. in economics; 3-5 years of experience in economic research, government, or teaching. Familiarity with national income accounts, business regulatory problems, and applications of economic theory to business